FAA AviationNews

AVIATION SAFETY FROM COVER TO COVER

MARCH/APRIL 2004

Cover Story:

Sun 'n Fun® 2004

U.S. Department
of Transportation

**Federal Aviation
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VOLUME 43 · NUMBER 2

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FRONT COVER: A Piper Seminole in flight. (photo courtesy of the manufacturer)

BACK COVER: A LearJet 31A in flight. (photo courtesy of the manufacturer)

Sun 'n Fun® visitors check out a light twin by the FAA Aviation Safety Center. (H. Dean Chamberlain photo)

SUN 'N FUN® 2004

by H. Dean Chamberlain

The annual Sun 'n Fun® EAA Fly-In in Lakeland, Florida is celebrating its 30th Anniversary this year. The dates are April 13 though 19. If you check your calendar, the days of the week for this year's Fly-In are different. In past years, the Fly-In was held from Wednesday though Tuesday. This year's Fly-In is from Tuesday through Monday.

For those not familiar with the Sun 'n Fun® EAA Fly-In held at Lakeland's Linder Regional Airport, it is the second largest fly-in in the United States. Only the Experimental Aircraft Association's (EAA) annual convention and fly-in, AirVenture®, held at Oshkosh, Wisconsin is larger. For many, the Sun 'n Fun® EAA Fly-In kicks off the new air show and fly-in season. For others, it is a great reason to visit Florida in April, see old friends, and checkout the latest aircraft and equipment for 2004.

The easiest way to find Lakeland and Linder Regional Airport on a map or chart is to look for them along Interstate 4 between Tampa and Orlando. Since Lakeland has a VOR (LAL), IFR pilots can locate it along Victor 533 between the Orlando (ORL) and the St. Petersburg (PIE) VORs.

Visitors tour some of the display areas at Sun 'n Fun®.

For those planning on going to the Fly-In, if you have not made your travel reservations and living arrangements to attend this year's Fly-In by the time you read this article, you need to do so quickly. The reason is many visitors make their reservations and travel plans a year or more in advance.

SUN 'N FUN® EAA FLY-IN INTERNET WEB SITE

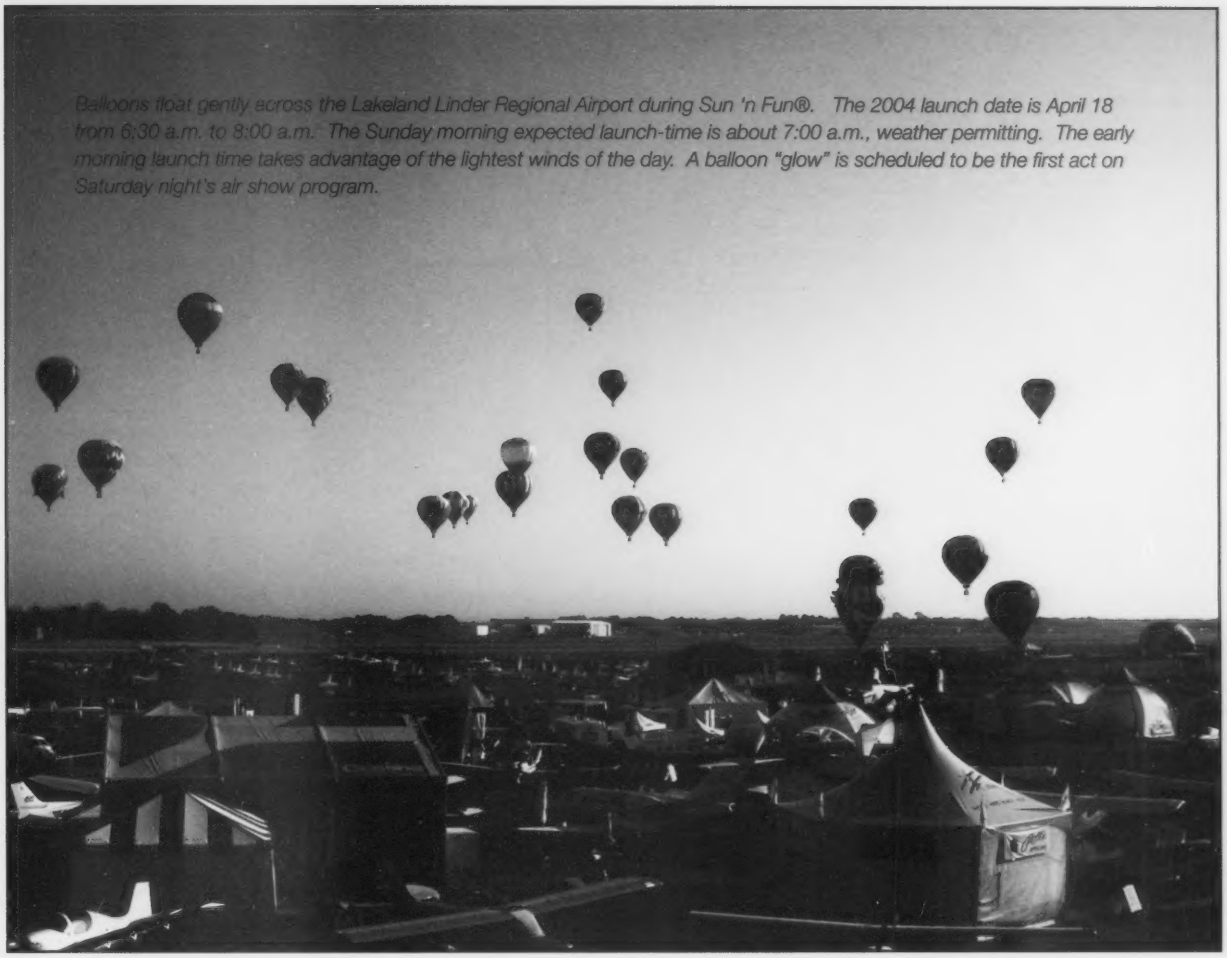
For readers with Internet access, the Sun 'n Fun® EAA Fly-In web site, <www.sun-n-fun.org/content>, provides detailed information on the event, activities, maps, and other related information. The site includes information on entrance fees, memberships data, driving directions, nearby airports, camping, and some lodging and transportation information.

FAA NOTAM AND INTERNET SUPPORT

An important element of the Sun 'n Fun® EAA Fly-In web site is its link to the FAA's Special Traffic Management Program (STMP) Notice to Airmen (NOTAM) for the event as well as how to obtain copies of the NOTAM.

In addition to the link to the complete NOTAM and how to obtain copies of the NOTAM, Sun 'n Fun's® web site also has a link to the FAA's Orlando Flight Standards District Office's (FSDO) homepage which has a special visual depiction of the VFR arrival procedure.

The following information was taken from the Orlando FSDO's web site at <http://www.faa.gov/fsdo/orl/>. "This information is a supplement to the officially published FAA Notice To Airmen (NOTAM) regarding procedures established for VFR arrival and departure to the Lakeland Linder Regional Airport during the 2004 Sun 'n Fun®, EAA Convention. This information is an effort to clarify those procedures with the use of high-resolution digital photographs showing the entire route. Any differences noted between what is shown here and what is provided in the official NOTAM should be brought to the attention of the webmaster of the Orlando FSDO web site. The official NOTAM takes precedence over what is shown here. To begin the pictorial tour of the VFR arrival procedure, please click on any landmark highlighted in yellow. We wish to thank the management and owners of Lance Aviation at the Lakeland Linder Regional Airport for provid-



Balloons float gently across the Lakeland Linder Regional Airport during Sun 'n Fun®. The 2004 launch date is April 18 from 6:30 a.m. to 8:00 a.m. The Sunday morning expected launch-time is about 7:00 a.m., weather permitting. The early morning launch time takes advantage of the lightest winds of the day. A balloon "glow" is scheduled to be the first act on Saturday night's air show program.

ing the FAA with the helicopter platform used to take these photographs."

The Orlando FSDO's graphic overview of the VFR arrival procedures into the Lakeland Linder Regional Airport (LAL) for Sun 'n Fun® is a great flight aid. Highlighted areas on the graphic can be "clicked" on by using your computer's mouse to show detailed photographic images of the respective area or landmark. If you have never flown into LAL, the visual images are a good way to familiarize yourself with some of the important VFR landmarks. Being able to quickly recognize designated landmarks is important when flying the special VFR arrival procedures into LAL during the Fly-In. When you find yourself number 10 or more in a line of aircraft flying the Lake Parker Arrival Procedure is not the time to discover you don't know what you are expected to do next. Your safety and the safety of those aircraft near yours depend upon you knowing the NOTAM procedures and following them.

For complete flight arrival and departure procedures for all types of aircraft, including VFR and IFR procedures, you can go to the Fly-In's web site listed and link to the FAA NOTAM, or you can review the NOTAM in the FAA's February 19 published NOTAMs, or you can go directly to the following FAA Internet web site, <http://www.faa.gov/NTAP/NTAP04FEB19/AS04001.HTM>.

It is important to review the information for your specific type of aircraft because the NOTAM lists specific speeds and altitudes for different types of aircraft, such as warbirds, multiengine, and others.

NOTAM EFFECTIVE DATES

This year's FAA Special Traffic Management Program (STMP) Notice to Airmen (NOTAM) is effective from 0700 to 2000 local time from April 11 through April 19. Please note the NOTAM's effective date is before the public opening of Sun 'n Fun®.

SELECTIVE NOTAM HIGHLIGHTS IN NO SPECIAL ORDER

The following are selective highlights from the NOTAM. Because we cannot reprint the complete NOTAM, only some of the published operational and safety related items will be published. Pilots planning on flying to Sun 'n Fun® or to or from airports near

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People wait for the FAA Aviation Safety Center to open. One of only two FAA Safety Centers in the country, the Lakeland Center is used throughout the year for aviation safety events. (H. Dean Chamberlain photo)

Lakeland during this period need to review the NOTAM because it may impact your flight.

SPECIAL IFR PROCEDURES

There are special IFR procedures during this period for IFR traffic going into and departing the Lakeland airport and neighboring airports as well as special procedures for southbound IFR traffic crossing Charleston (CHS) via V1 effective from April 11 through 19.

The NOTAM outlines the special IFR reservation program for the Fly-In. Basically, a slot reservation is required for all domestic, non-scheduled IFR arrivals and departures to or from the following airports from April 11 though 19 from 0700 until 1859 hours daily EDT, (1100-2259 hours UTC). The airports are:

- Lakeland Linder Regional (LAL);
- Plant City Municipal Airport (PCM);
- Bartow Municipal Airport (BOW);
- Lake Wales Municipal (X07); and
- Winter Haven Gilbert Airport (GIF).

The NOTAM explains how IFR pilots can request an arrival or departure slot to or from these airports. Slots can be reserved starting at 0700 EDT (1100 UTC) Thursday, April 8. Reservations will not be assigned more than 72 hours in advance.

Flight plans filed in the air and changes of destination from airborne flights to the above airports will not be accepted except in emergency situations.

IFR pilots need to review the VFR Sun 'n Fun®-Lake Parker Arrival and Departure Procedures because they may have to discontinue their IFR approach and enter a VFR traffic pattern for landing when conditions permit.

IFR pilots need to review the complete NOTAM for information unique to IFR arrival and departure procedures for Sun 'n Fun® operations.

AIRSPACE, MODE C VEILS, AND TRANSPONDERS

All pilots are reminded that if you are planning to fly to Sun 'n Fun®, you may fly near the Tampa and Orlando Class B airspaces. VFR Pilots need to remember that the appropriate Air Traffic Control facility has to authorize entry into its Class B airspace.

The NOTAM also provides information for operating without a transponder within designated areas of the Mode C Veil of each Class B area.

Linder Regional Airport is within Class D airspace.

FAA SAFETY CENTER

The FAA Safety Center is the home of the "Meet the FAA" session; safety presentations by industry experts and FAA safety inspectors; and FAA exhibits sponsored by various FAA organizations.

One of the most popular presentations at the FAA Safety Center is the "Meet the FAA." Senior FAA managers from Washington Headquarters are normally on hand to answer questions from the audience.

For those unable to attend a specific session, all or part of the sessions will be broadcast on the local Sun 'n Fun® Radio on 1510 am. This low-power broadcast service normally covers the grounds of Sun 'n Fun® and the surrounding area. You should check for coverage in your specific area.

The Orlando FSDO will have representatives available at the FAA Safety Center to answer questions and help anyone who may have an issue requiring a safety inspector's help. The FAA Safety Center opens at 0800 (local).

FAA SAFETY CENTER'S TEMPORARY FLIGHT SERVICE STATION

In addition, a temporary non-automated Lakeland Flight Service Station (TFSS) will be operating in the FAA Safety Center during the Fly-In. The TFSS's hours are 0600-1900 (local) from April 13 through 19. On April 20, its hours will be 0600-1400 local. The

Different types of seaplanes beached along Lakeland's Lake Parker attract curious spectators as part of the Sun n' Fun® activities.

TFSS provides weather briefings, flight plan services, and flight planning information needed for operating to and from Lakeland during the Fly-In.

Complete flight services are available from the St. Petersburg Automated Flight Service Station by telephone at 1-800-992-7433 (1-800-WX-BRIEF) or by using the direct-dial telephone on the west end of the FAA Safety Center building.

Please note the special instructions in the NOTAM about air filing and canceling of flight plans.

SPECIAL AIR TRAFFIC MANAGEMENT PROGRAM NOTAM

As we say each year, finding yourself number 10 in trail in the special VFR Lake Parker Arrival Procedure to enter the traffic pattern for landing is not the time to wonder what is going to happen next.

- The NOTAM outlines the special holding procedures to be used at Lake Parker and other sites if holding is required at Lakeland.
- Pilots are reminded to always fly in trail. Side-by-side separation is not permitted.
- Pilots need to be ready to fly closer to more aircraft in flight than they ever thought possible.

Although the STMP arrival and departure procedures are not complicated, they need to be understood thoroughly. The procedures are designed to move hundreds of different types of aircraft safely, quickly, and predictably in and out of Lakeland by having both pilots and controllers follow the same published procedures. Knowing and following the published procedures are especially important in the case of an emergency at Lakeland or one of the outlying airports.

All pilots need to review and comply with all of the provisions of the NOTAM to try and avoid any incident or security breach that might negatively impact general aviation.

Pilots need to remember that special, reduced arrival and departure separation standards are in effect during this period.

IFR AND VFR LANDING PROCEDURES

VFR aircraft and IFR aircraft when the ceiling and visibility at Lakeland is reported at or above 3,000 feet and five miles visibility can expect to follow the standard VFR Lake Parker Arrival Procedure to the airport.

- Small general aviation VFR traffic can expect to land on what is normally a taxiway at Lakeland Linden Regional Airport.
- As noted in the NOTAM, two aircraft at a time may be landing on that taxiway redesignated as Runway 9L and 27R during this period. The width of this temporary runway is 75 feet.
- As shown in the NOTAM, Runways 9L and 9R have displaced thresholds. Temporary Runway 9L will also have two designated touchdown points marked by signs in addition to its strobe-marked displaced threshold area. Aircraft landing on Runway 9L will be told to land either at the threshold or one of the two designated touchdown points: spot 1 or spot 2. This is how three aircraft may be landing on Runway 9L at the same time, so it is important that all three aircraft know and follow the correct landing procedure.
- Aircraft are not to land on the main, wide runway 9R and 27L,

unless specifically instructed by the control tower.

- The NOTAM includes closed runway and changed instrument procedures.
- All landing pilots are advised to watch for possible wave-offs signals by radio, red smoke, or by hand signals from the red-shirted air traffic controllers located near the approach end of the runway in use. The NOTAM explains the special wave-off procedures for no-radio aircraft.
- Once an aircraft has landed, pilots are expected to clear the runway as soon as possible onto a hard surface.
- The NOTAM contains detailed instructions on landing and taxiing procedures for all types of aircraft as well as the use of special cockpit parking signs.

RADIO PROCEDURES AND WING ROCKING

There is limited use of radio communications to control aircraft landing or departing Lakeland. The NOTAM outlines when pilots should communicate and when they should just monitor their radios. Strict compliance with the published communication procedures will avoid any unnecessary frequency congestion while speeding up the landing or departure process.

Although pilots are asked to comply with the radio procedures outlined in the NOTAM, pilots should contact ATC immediately if there is any question of safety of flight or in case of an emergency.

Many of the procedures used at Sun n' Fun® involve just monitoring the appropriate ATC frequency. Pilots just have to remember their aircraft type and color. While monitoring ATC, you might hear something like this, "Red and White biplane, rock your wings for identification. Now, follow the aircraft in front of you to the airport."

The NOTAM says to, "Rock your wings with 'gusto' for airborne acknowledgement."

NO-RADIO PROCEDURES

All pilots should remember some of the aircraft flying to and from Lakeland don't have radios.

The NOTAM outlines the procedure for no-radio aircraft operations into and out of Lakeland. If your aircraft is not radio equipped, you will need special authorization to operate from 0700 to 1900 hours local from April 12-19. The NOTAM explains how to request the authorization.

AFTER LANDING

Landing pilots need to clear the runway as soon as possible onto a hard surface. The need to expedite traffic is why everyone needs to review the operating procedures outlined in the NOTAM.

- It is important that aircraft remain on a hard surface, unless specifically directed by the tower or flagman to do otherwise.
- As the NOTAM states, "Expeditious clearing of the runway is ABSOLUTELY ESSENTIAL because of continuous arriving and departing aircraft behind you."
- EAA ground personnel on the south side of Runway 9R/27L will direct aircraft to parking.
- Flashing arrows are also used to indicate taxi route.
- Pilots are not to leave their aircraft until their aircraft are parked and tied down.

AIRCRAFT COCKPIT SIGNS

To expedite aircraft parking, the NOTAM asks pilots to make a light colored sign with large dark lettering that is readable from 50 away feet with the appropriate code for your desired parking area. The NOTAM lists the codes for the various parking areas.

AIRSPACE

VFR pilots should pay particular attention to the airspace information given because of the proximity of the Tampa and Orlando Class B airspaces. The NOTAM explains how to transit the Class B Mode C Veils without a transponder for those aircraft required to have one by using specific corridors and altitudes.

Pilots must not enter Class B airspace without the appropriate ATC authorization.

WAYS TO MINIMIZE RISK OF MIDAIR COLLISION

With so many aircraft flying to, from, and near the Lakeland area during this period, there is an increased risk of midair collision. Pilots are asked to be extra careful while watching out for other traffic in the Lakeland area. Since there is such a performance mix among the thousands of different types of aircraft flying to, through, or in the Lakeland area during this period, it is important that every pilot, when in VFR conditions, follows the see and avoid concept. You should adjust your scan for possible blind spots in your cockpit. When able, monitoring ATC for possible traffic is another safety factor.

Because it is easy to become distracted and miss looking out of the cockpit for traffic while programming complex aircraft equipment such as a GPS unit, such programming should be done on the ground or in advance whenever possible.

AIRSPEEDS, ALTITUDES, ROUTES

The NOTAM specifies certain airspeeds, altitudes, and routes of flight for different types of aircraft flying into Lakeland Linder Regional Airport for Sun 'n Fun®. Pilots need to review these speeds, altitudes, and routes and fly them. If you cannot fly safely at the specified airspeed for your type of aircraft, you should contact ATC.

At the same time, everyone needs to remember, a few pilots may not know or comply with the NOTAM procedures. Everyone needs to lookout for any non-conforming aviators.

HELPFUL SAFETY TIPS

- Because of the increased mid-

A Vultee BT-13 (Basic Trainer) Valiant *taxies down the line. According to the U.S. Air Force Museum, the* Valiant *was the most widely used basic trainer by the USAAF in WW II.*

air collision risk in the Lakeland area, pilots are asked to turn on their landing lights and beacon or strobe lights within 30 miles of Lakeland.

- Pilots should monitor the appropriate ATC frequencies listed in the NOTAM when flying within the central Florida area.
- Pilots should expect the unexpected because some pilots will fail to read the NOTAM, some will forget what they have read, and some will simply do something dumb.
- Because of the traffic volume flying into and out of Lakeland, "...student pilot training flights are highly discouraged during this event. This includes student solo cross country flights, touch-and-go-landings, low approaches, and practice instrument approaches."
- The key to your flight safety is to keep your eyes open and be prepared to react to the unexpected.
- Everyone is reminded not to stand on, near, or walk across runways.

ELT MONITORING EN ROUTE AND AFTER LANDING

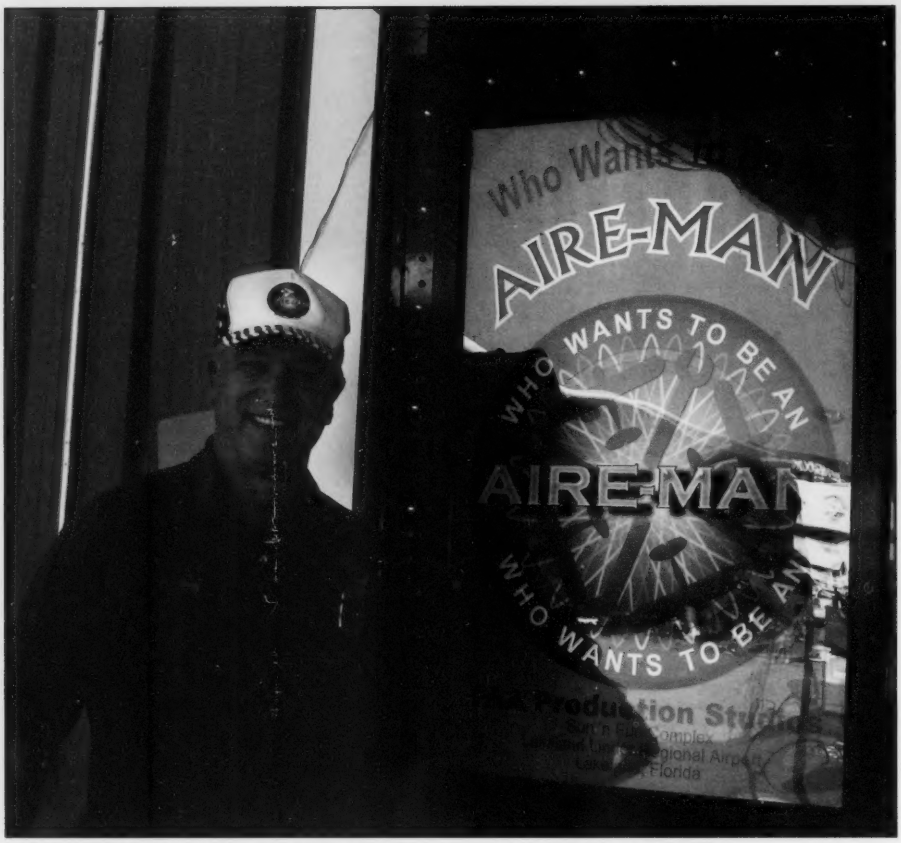
Pilots flying to and from Lakeland should periodically monitor 121.5 MHz on their radio en route to check for any activated emergency locator transmitters (ELT) that might be reporting an aircraft accident. If you detect an ELT signal, contact the nearest air traffic control facility with the information.

Pilots should also check 121.5 MHz before turning off their radio and shutting down their airplanes after reaching their tie-down spots to make sure their ELT has not inadvertently activated. If your ELT has activated, please shut if off and notify the Flight Service Station folks at the FAA Safety Center or ATC.

EXTRA FUEL AND CRITICAL FUEL STATE

Because of the potential delay with so many aircraft operating at Lakeland, including the risk of an accident on the field which might close the airport for a while, all pilots should make sure they have enough extra fuel on board for the flight including the appropriate IFR or VFR minimums plus enough fuel for an in-flight hold of at least 30 minutes or more. Just stay within your approved weight and balance limitations.

You may want to have an alternate plan and destination in mind in case you can't get into Lakeland.



FAA Safety Program Manager Cary Mendelsohn poses in front of the AIRE-MAN show poster. The AIRE-MAN logo was created by Safety Program Manager Randy A. Williams.

If you reach a critical fuel state, notify ATC immediately.

VFR FLIGHT PLANS

Pilots on VFR flight plans are asked to extend their estimated time of arrival by 30 minutes to compensate for any unexpected traffic delays.

VFR pilots are asked to include their aircraft's color in the remarks section of their flight plan.

All pilots (IFR AND VFR) should review the special flight plan filing and closing procedures in the NOTAM.

VFR pilots are asked to close their inbound VFR flight plans while airborne. The reason is there may be delays of up to 30 minutes while parking your aircraft.

During the Fly-In, "Lakeland Radio" is available from 0600 to 1900 hours local on 122.05 MHz to activate and close VFR flight plans.

SAFETY NOTES

Because of the mix of traffic, all pilots might want to practice flying their aircraft at its minimum safe, the operative word is SAFE airspeed, before arriving at Lakeland. You should be able to control your aircraft safely at its slowest, normal cruise, and at a speed faster than normal cruise. The reason is you may be mixed in with other aircraft that may be flying slower or faster than you might normally fly. You may also need to be able to maintain your place in trail of other aircraft. **If you cannot safely reduce airspeed to follow slower traffic, inform ATC and do not, we repeat do not, fly at any airspeed that jeopardizes your safety of flight.**

Pilots should also bring their own tie-down gear and anchors if possible.

You might want to carry a survival kit. The basic survival rule of being dressed and prepared to walk home regardless of the conditions and weather is always a good one. Sun block, shorts, T-shirts, water bottles, and rain gear should round out your Florida "survival" items, but keep in mind the weather you are leaving, along your route, and that of your return trip.

GRASS-FIELD OPERATIONS

If you need a special grass-field operation, you can submit a request for a "Special Grass-Field Authorization and Procedures" by contacting Sun 'n Fun® at the address listed in the NOTAM. According to the NOTAM, limited grass-field operations can be accommodated.

SUN 'N FUN® EAA FLY-IN INC.

Sun 'n Fun® EAA Fly-In's Internet web site provides not only the history of the event, but also all of the current information you may need or want to attend the Fly-In. Its mail address is P.O. Box 6750, Lakeland, FL 33807. Its telephone number is (863) 644-2431.

SPECIAL SECURITY ALERT

As a result of the increased security requirements across the Nation, such as the special Air Defense Identification Zone around the Washington-Baltimore area, all pilots are cautioned to check the latest NOTAMS for any special airspace restrictions that might be issued before, during, and after the Sun 'n Fun® EAA Fly-In that could effect your route of flight to and from Lakeland.

AIRPORT CLOSING AND AIR SHOW HOURS

The NOTAM lists the hours Lakeland Linder Regional Airport will be

A contestant prepares to answer an aviation question as members of the audience read the question on the big screen.

closed for aerobatic demonstrations starting on April 13 through 19. The airport will close daily at 1345 hours local for the demonstrations. No arrivals or departures are permitted during the demonstrations without approval by the airport manager, Sun 'n Fun®, and ATC. Arrival traffic will not normally be accepted until 1800 hours local after each day's demonstrations. The delay is to permit departing traffic to leave the airport.

The NOTAM also lists the closed airport operating areas and the times and restrictions for those areas.

WHO WANTS TO BE AN AIRE-MAN

The popular Ft. Lauderdale FSDO Safety Program's "Who Wants to be an Aire-Man" quiz show will be held at the FAA Safety Center April 13, 14, 15, and 17 at 12:30 pm. Contestants test their aviation knowledge in a format similar to the popular "Who Wants To Be A Millionaire?" TV program.

Last year's contestants having the fastest finger on their "remote control joystick," which corresponded to a different colored runway light, competed to answer an aviation related "trivial question." The correct answer earned that contestant a trip to the "hotseat." Once there, they were asked questions pertaining to: regulations, good operating practices, weather, ATC procedures, airport signage, and runway markings. Maintenance related questions were put to the one mechanic making it to the "hot seat."

Last year's prizes at Sun 'n Fun® ranged from free meals at various restaurants to the one million-point prize, which was a ride in a Goodyear airship, compliments of Goodyear Tire and Rubber Company, located in Pompano Beach, Florida.

For more information about the "Who Wants to be an Aire-Man" program, you can check the Ft. Lauderdale FSDO's web site for the program at <http://www.faa.gov/fsdo/fll/airefly.htm>.

DISCLAIMER

Pilots need to check current NOTAMS for any changes to the Special Traffic Management Program for Sun 'n Fun® as part of their flight planning.

SUN 'N FUN® 2004

FAA Safety Center Forum Schedule*

April 13 to April 19, 2004

Time & Date	13 Tuesday	14 Wednesday	15 Thursday	16 Friday	17 Saturday	18 Sunday	19 Monday
0830	Safety Through Education	Unexpected events in aviation. They are not what you think.	Collision Avoidance AOPA ASF	Maintaining Your Medical	Airspace AOPA ASF	Flying the Islands of the Bahamas	No Activity
Presenter	Schamel	Kochan	Grady	Dr. Jordan	Grady	-	-
1000	Flying the Islands of the Bahamas	Stall/Spin Prevention & Survival	Practical Risk Management	Ups & downs of takeoffs & landings AOPA ASF	Pilots guide to Rotax aircraft engine	Runway Safety	No Activity
Presenter	-	Alfonso	John & Martha King	-	Lockwood	-	-
1115	Closed meeting Airshow briefing	Closed meeting Airshow briefing	Closed meeting Airshow briefing	Closed meeting Airshow briefing	Closed meeting Airshow briefing	Closed meeting Airshow briefing	Closed meeting Airshow briefing
Presenter	-	-	-	-	-	-	-
1230	Who wants to be an Aire-Man?	Who wants to be an Aire-Man?	Who wants to be an Aire-Man?	Meet the FAA	Who wants to be an Aire-Man?	Engine Failure Prevention & Survival	Finale Recap of Sun 'n Fun 2004 Airshow & Events
Presenter	Mendelsohn	Mendelsohn	Mendelsohn	-	Mendelsohn	Alfonso	-
1400	Runway Safety	Weather — or Not?	Maneuvering Flight AOPA ASF	Single Pilot IFR AOPA ASF	Maneuvering Flight AOPA ASF	Ups & downs of takeoffs & landings AOPA ASF	No Activity
Presenter	-	Brady	Grady	Grady	Grady	Grady	-

Opening Ceremonies - April 13, Seaplane Splash-In - April 15-19 @ Lake Parker, Balloon Launch — April 18 @ 0630 (backup April 19), Forum Open: Daily @ 0800, Night Airshow — April 17 *** Subject to Change**

VFR arrival photo NOTAM addendum at <http://www.faa.gov/fsdo/orl/snfland/arrivalphotos/index.htm> (Not official FAA NOTAM)

Some or all of the presentations at the FAA Safety Center & Production Studio will be simulcast on Sun 'n Fun Radio, 1510 AM

Look for presentations on ATN, the Aviation Training Network, GETN, the Government Education Training Network, FAN, and the Florida Aviation Network, on March 15 and April 5 at 1100 ET and again on April 13-19 at 1230 ET.

Those That Have And Those That Will... What you can do before the engine fails

story and photo by Michael W. Brown

Less than a century ago, when powered flight was in its infancy, any pilot possessing the skill and good fortune needed to amass flying time was well practiced in handling mechanical (particularly engine) failures. This was due to the comparatively primitive state of the technology at the time that afforded aviators many opportunities to perfect these talents. Fortunately, as time marched on, aviation made advancements in engine design and manufacturing. Today, in-flight engine failures have evolved from an operational norm, to an event that occurs at intervals measured in the thousands of hours.

Still, when engines do fail, they have an annoying and potentially tragic tendency to do so at the most inopportune time. Of course "inopportune" could be any time other then when sitting on the ramp. However, the degree of inconvenience tends to be inversely proportional to the volume of air beneath you—the lower you are, the fewer your options, the greater the nuisance.

For this reason, a great deal has been written on how best to manage engine-out emergencies (in a single-engine aircraft) at lower altitudes, particularly during take-off. Although a century's worth of aviation literature has left few parts of this discussion uncovered, it can be argued that any experience adds to the sum total of our knowledge.

Not long ago, I found myself with the opportunity to add my own first hand account to this existing reserve of knowledge. Because I had the good fortune to weather such an emergency unscathed, I was able to gain a lesson of immeasurable value. While you may never find yourself behind a malfunctioning power plant, my hope is that insights and lessons gained during my incident will help you should you experience an engine failure.

That Fateful Day

It was a late summer afternoon (forgive the poetic prose), and my friend and I were on a short final to Runway 5 at our home airport. As luck would have it, the airplane on the runway had missed its intended turn-off and would not be clear in time for us to land. The situation was easily handled, as we executed a go-around and began our climb. At some point between 450-500 feet above ground level (AGL), the engine, which until that moment had run perfectly, suddenly experienced a significant power loss. The onset of the engine failure was so sudden and dramatic as to leave little doubt that we would be landing sooner, rather than later.

At this point, we began a left turn back toward the runway. There was only a slight crosswind, and a left turn

took us away from the right traffic pattern (and another aircraft now on downwind). We now found ourselves over the intersecting runway, and although an abbreviated downwind-base-final turn to Runway 12 was possible, we elected to continue the turn back to Runway 23. We had the altitude, and Runway 23 had the virtue of greater length and more open space adjacent to each side, including a generous overrun area that would later prove quite useful.

As we took a 45-degree cut (following our 180-degree turn) toward our modified base-to-final, we saw a Mooney departing upwind. Fortunately, we made visual contact, and it was no factor as we began our final turn toward the runway. We landed with less than a third of the runway remaining. Through normal braking, we were able to slow down to approximately 25-30 knots before departing the runway end. The overrun area provided an obstruction-free field for us to complete our landing roll. No metal was bent, and nobody was hurt. As engine failures go, the event proved rather benign. We later found the culprit to be a piece of insulation that came loose from the air box and found its way into the carburetor.

Lessons Learned

Although I would like to claim cunning and skill, the fact is success resulted as much from good fortune as superior airmanship. The weather conditions were beautiful with good visibility and ceiling and very little wind or turbulence. We were also fortunate to have enough altitude to provide us with several potentially life-saving options. Combine these with a lack of other air traffic, the engine's mode of failure (no thrown rods, no oil on the wind screen), and the runway length and overrun area, and clearly the deck was stacked in our favor. This point was not lost on me as I began analyzing the emergency and each of the events that followed. As a result, I was able to draw several conclusions.

First, the addition of a second pilot may be a blessing or a curse, depending on how you manage your resources. Although I was pilot in command (that was determined before the flight), my friend (also a rated pilot) was flying the aircraft at the time of the incident. While the temptation to assume control was great, his management of the situation warranted no such change. For me to take over at that time would have only made a bad situation worse. Instead, I undertook the role of monitor, keeping a close eye on the airspeed indicator and turn coordinator, while watching out for traffic and managing other cockpit duties. This left the other pilot with only one responsibility—to fly the airplane.

If there are two rated pilots on board, it is imperative that each knows his or her role in the event of an emergency. Perhaps the pilot conducting the take off is not the best person to fly the airplane should an engine fail at lower altitudes. Two hundred feet AGL is the worst moment to have such a debate, and, in an engine out scenario where time is precious, you cannot waste it discussing who will fly the airplane. Determine when, if, and how control of the aircraft will be transferred before take off.

If you are not the one flying the airplane, there are several things you can do to help facilitate a safe outcome. First, help in locating a suitable landing site. Next, watch for traffic and make radio calls as time allows. Also, help the pilot flying by calling out airspeeds and watching the turn coordinator. If necessary, remind the pilot flying to keep the ball centered. Finally, since you are not flying the airplane, you are free to start securing the aircraft once committed to a landing (fuel and electrical systems- off, door- ajar, etc.).

A second point worth mentioning, the desire to do no harm to the aircraft is far more intense than you might imagine. Do not let this dictate your actions. In retrospect, I was amazed that during the event, which lasted less than a minute, I could not recall any thought being given to my own peril. However, I vividly remember how much I wanted to avoid damaging the airplane. While your fate and that of the aircraft's are very much intertwined, just remember a crumpled landing gear or bent propeller is a small price to pay for minimizing the risk of personal injury.

Next, for most general aviation (GA) pilots, 80-90% (or more) of their flying is done from the same four or five airports. Given this, spend some time surveying the terrain around these airports from the air. For each runway end, locate the open spaces that may serve as potential off-airport landing sites. For unfamiliar airports, you may note such things during your arrival (as workload and conditions permits). Calculate where you can land and give some thought to your arrival. Armed with this information, you can have a mental strategy in place should a problem occur.

To that end, you should review this strategy before every departure. Most multi-engine pilots are taught to conduct pre-departure briefings in case of an emergency, but this is often not the case for those flying singles. The goal is to be "spring loaded" to execute your plan should it become necessary. Keep in mind you're planning for a worst-case scenario, and a dent-free airplane is not the goal—walking away from the airplane is. When developing a plan, remember to consider factors such as weather (density altitude, wind, etc.), runway length, airport environment, and of course the aircraft. They all impact your strategy.

Finally, the airspace below 500 feet AGL is no place to trouble shoot engine difficulties. If everything was working a minute ago while you were on the ground, there is probably little you can do to remedy the problem once you've departed. You may have time to engage the auxiliary fuel pump and perhaps switch fuel tanks, but that's likely to be it. Time and effort committed to any other actions is potentially dangerous and should probably be avoided. Instead, focus your energies on flying the aircraft and preparing for the inevitable landing.

Other Considerations

To turn back or not to turn back—

there are many variables (wind speed and direction, airport configuration, runway length, air and ground traffic, the airplane being flown, etc.) that will influence your answer, but again, time will not be on your side in an emergency. Should disaster strike below 500 feet AGL, a turn back to the runway is likely ill advised. However, you may have a perpendicular runway, taxiway, or open field that requires only a 90 degree turn to reach it. If this is part of your prearranged escape plan, make certain to include it in your pre-departure check. Knowing if other traffic is on such movement areas could prove extremely important if called upon to put your plan into practice. Above 500 feet (again, this is not a magic number), you may be able to turn back under the right set of circumstances. Just remember, it's better to make a controlled landing into a small space than an uncontrolled crash into an open field—or anywhere else for that matter.

Another potentially difficult situation comes with a partial versus a complete engine failure. If the power loss is complete and/or the failure is catastrophic, it is much easier to mentally commit to an emergency landing. On the other hand, if the engine is making at least some power, the temptation is to press on and attempt a normal landing. Of course, the advantage of a partial engine failure is the remaining power may provide options that might otherwise not exist. However, this may compel you to abandon an advantageous landing site in favor of something better, like a runway. Unfortunately, partial engine failures have a tendency to become complete engine failures. While no pilot wants his or her flight to end somewhere other than an airport, the open field or highway median rejected one minute may prove better than the crowded parking lot or apartment complex facing you the next.

So what should you do? If the only option(s) available to you are unfavorable, meaning that in your judgment serious injury or loss of life is inevitable, use whatever power you may have to find a more suitable landing site. However, if you have a "sure thing" and you feel you can land and walk away, by all means take it. Don't think about how you'll explain your actions to the flight school or insurance company, and in particular, don't waste time worrying about the FAA's response. You have both the authority and responsibility to deviate from the regulations to the extent required to address the emergency. Contrary to popular opinion, the FAA has no process in place that's worth dying to avoid. If you can say in all good conscience "I was losing power and landing here afforded my passengers and I the best chance of survival while minimizing the threat to persons on the ground," how can anyone second-guess that?

The Bottom Line

Every flight, at its most basic level, is an exercise in risk management. Anything you can do to identify and mitigate those risks improves your chances of successfully managing an emergency, particularly the loss of an engine during take off. While a little luck will go a long way, the more you plan, the less good fortune you'll need.

In a scenario such as the one I've described, your goal is to minimize the time spent in what I like to call "No man's land." That is, the period of time where you have no suitable or definitive location to land in the event of an engine failure. With proper planning, you may be able to reduce that time down to zero. In other cases, you may find the time spent in no man's land is uncomfortably long—20 or 30 seconds.

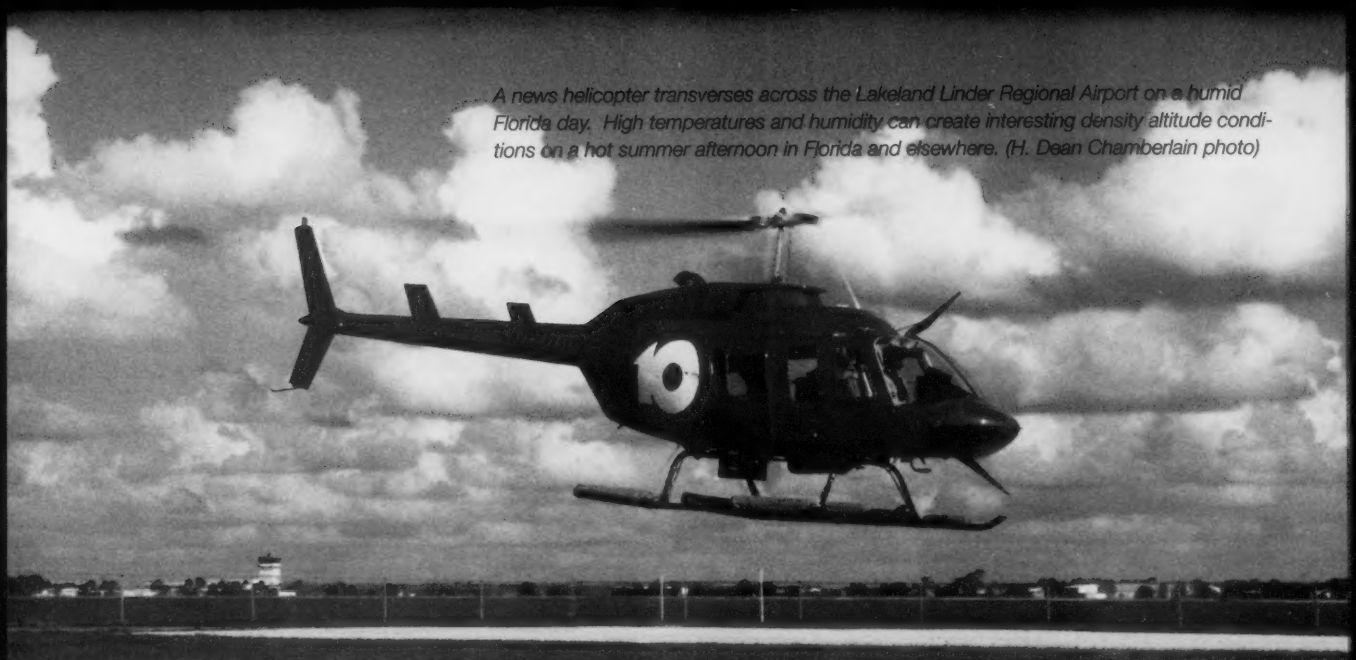
For example, take a Cessna 172 departing a 7,000-foot strip on a typical spring day. Given the take-off and landing performance of this aircraft, coupled with the runway length, plus any runway safety areas, you may determine that following an engine failure you can land straight ahead from a height of 200 feet AGL. In your pre-departure briefing, you could say, "Engine failure on the runway—power to idle and brake while maintaining directional control. Engine failure below 200 feet—power to idle, pitch for the recommended glide speed, land the airplane and brake as appropriate." You may have determined that an open farm field south of the airport would make a suitable landing site. If you calculate it is possible to reach that field once you are above 200 feet AGL, you may now have an escape plan that encompasses your flight from takeoff roll to 500 feet AGL.

From that point forward, you may choose the field, a turn back to the runway, or fly a normal pattern, whichever is most appropriate. Since my engine-out episode, now at every 100 feet, I call out (verbally or mentally) where I'm going if the engine quits. I do this until reaching an altitude at which I figure a reasonably normally pattern may be flown in an emergency. I find this helps to maximize my state of mental preparedness, and at any given time, I know exactly where I'm going should the engine fail. I may not always like my options, but I know what they are. As a result, no time will be wasted.

This brings me to my final point. The FAA uses four seconds as the period of time required to react in an emergency. While this is not a great deal of time, it is long enough for airspeed to erode, altitude to be lost, and an excessive rate of descent to be established. Four seconds is enough to glide another 300-400 feet, open a door, switch fuel tanks, or turn several degrees. Given this, your actions must be immediate and precise. As a wise instructor once told me, "Move with deliberate speed, and avoid panic speed at all costs." To that I would add, there's no substitute for thorough preflight planning.

Editor's Note: Pilots should review the takeoff and emergency procedures for their aircraft before each flight as part of their takeoff planning.

Michael W. Brown is an Aviation Safety Analyst in Flight Standards Service's General Aviation and Commercial Division.



A news helicopter transverses across the Lakeland Linder Regional Airport on a humid Florida day. High temperatures and humidity can create interesting density altitude conditions on a hot summer afternoon in Florida and elsewhere. (H. Dean Chamberlain photo)

Relative Humidity - The Invisible Peril

by Roger "N" Clark

Ever since the days we were in ground school or viewing VCR tapes (CD's depending on your age), we have been taught what effect density altitude has on aircraft performance. Hopefully, we became aware of the fact that when density altitude increases, engine performance, thrust and lift decreases, and takeoff and landing distance increases. Do you remember the factors that affect density altitude? If you were to answer pressure altitude, temperature, and relative humidity, I would say your memory is excellent.

Yet, every year, we continue to have takeoff and landing accidents with density altitude as a contributing cause. Why? We can figure takeoff performance by using our flight computer or calculator and figuring in our given of pressure altitude, temperature, and relative humidity to determine density altitude. Right?

Once we have calculated density altitude it's merely a matter of referring to performance charts in the owner's manual, pilot operating handbook, or flight manual and determine approximate takeoff distance. I say approximate because the charts are there to sell airplanes. How many of you are professional pilots flying new airplanes with new engines developing maximum rated horsepower?

But, wait a minute. How do I figure relative humidity to determine the density altitude? It must be significant as many times as it's been mentioned. Now enters "Relative Humidity -The Invisible Peril."

As a Safety Program Manager I am continually involved in reviewing accident files to search for causal factors contributing to accidents. I believe relative humidity has been a significant contributor to accidents. Let me give you an example.

It's a typical midwestern summer afternoon with a pressure altitude of 1,000 feet, temperature of 87 degrees F, dew point 77 degrees F, and a light and variable surface wind. A pilot has a couple of friends who want to go up for a local flight departing a grass strip. What affect does this weather condition have on performance? Remember I said it's a typical midwestern summer afternoon—hot, humid, and hazy. All the elements are in place to adversely affect performance—an invitation to an accident or incident.

We now have some information for figuring in a correction factor for relative humidity and temperature. (This will be explained later in the article.) In this example, when we correct for relative humidity, we have a density altitude of approximately 3,600 feet. Almost four time as high as the pressure altitude. No wonder the airplane doesn't perform as well as we think it should.

The correction factor becomes even more significant as temperature

and humidity increase. Another example is a temperature of 92 degrees F, relative humidity of 92%, and pressure altitude of 2,000 feet.

Density altitude (not considering relative humidity) is 4,500 feet.

Corrected density altitude (figuring in relative humidity) is 6,200 feet.

In the past when conducting safety seminars, I have discussed accidents that have had density altitude accompanied by high relative humidity as a causal factor. In discussing these accidents, I challenged the audience to refer to any type of appropriate reference material to see what correction factor could be applied for relative humidity. To my knowledge, there hasn't been any—until now.

To my pleasant surprise, one of the pilots in an audience a few years past sent me a 29-page thesis on "Performance Altitude Correction for Humidity." Robert Rolfes of California, who is an ATP, Certificated Flight Instructor, and Ground Instructor, wrote the article

The following information is extracted from Mr. Rolfes' thesis.

ABSTRACT

Aircraft performance is based upon the density of the surrounding air. Fundamental aviation training references characterize the density of air as a function of pressure, temperature, and humidity. Procedures exist for computing pressure and temperature deviations from standard conditions. Pressure deviations are corrected by calculating pressure altitude. Temperature deviations are corrected by calculating density altitude. However, no such corresponding corrections exist for humidity.

With a performance altitude that is corrected for pressure, temperature, and now humidity, aircraft performance values extracted from data will more precisely predict performance and add a correction that improves safety. If one life is saved or one accident prevented because of the information presented here, it will have repaid the author's efforts ten thousand fold.

BACKGROUND

Our aircraft engines use air as the working fluid to produce power. Air under atmospheric pressure is forced into the inlet plenum, heated and expanded in the aircraft's engine, thereby driving a propeller or expanding out a jet nozzle. Turbocharging takes atmospheric pressure air and compresses it and forces higher-pressure air into the engine. In any scenario, the amount of air that enters and is processed by the engine is a function of the air density. The more air entering the engine, the more power that is produced.

The density of the air that enters the intake manifold is a function of pressure, temperature, and humidity. Pressure, temperature, and humidity have a great influence on airplane performance, because of their effect upon density. Pressure correction on density is accounted for by calculating pressure altitude. This maps the current station altitude into the equivalent altitude in the standard atmosphere. Temperature corrections on density are accounted for by computing density altitude. This correction accounts for the temperature differences between station temperature and the temperature in the standard atmosphere. However, no easy correction exists for humidity.

STATEMENT OF THE PROBLEM

"The small amount of water vapor suspended in the atmosphere may be almost negligible under certain conditions, but in other conditions humidity may become an important factor in the performance of an aircraft." Can we develop an easy to determine and easy to use humidity correction that works under all conditions, convert it into a pseudo-altitude change that when incorporated into the other performance altitudes, i.e., pressure altitude and density altitude, it yields a "truer" performance prediction? Happily, the author's answer is yes.

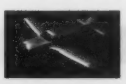
HUMIDITY CORRECTION SPECIFICIATIONS

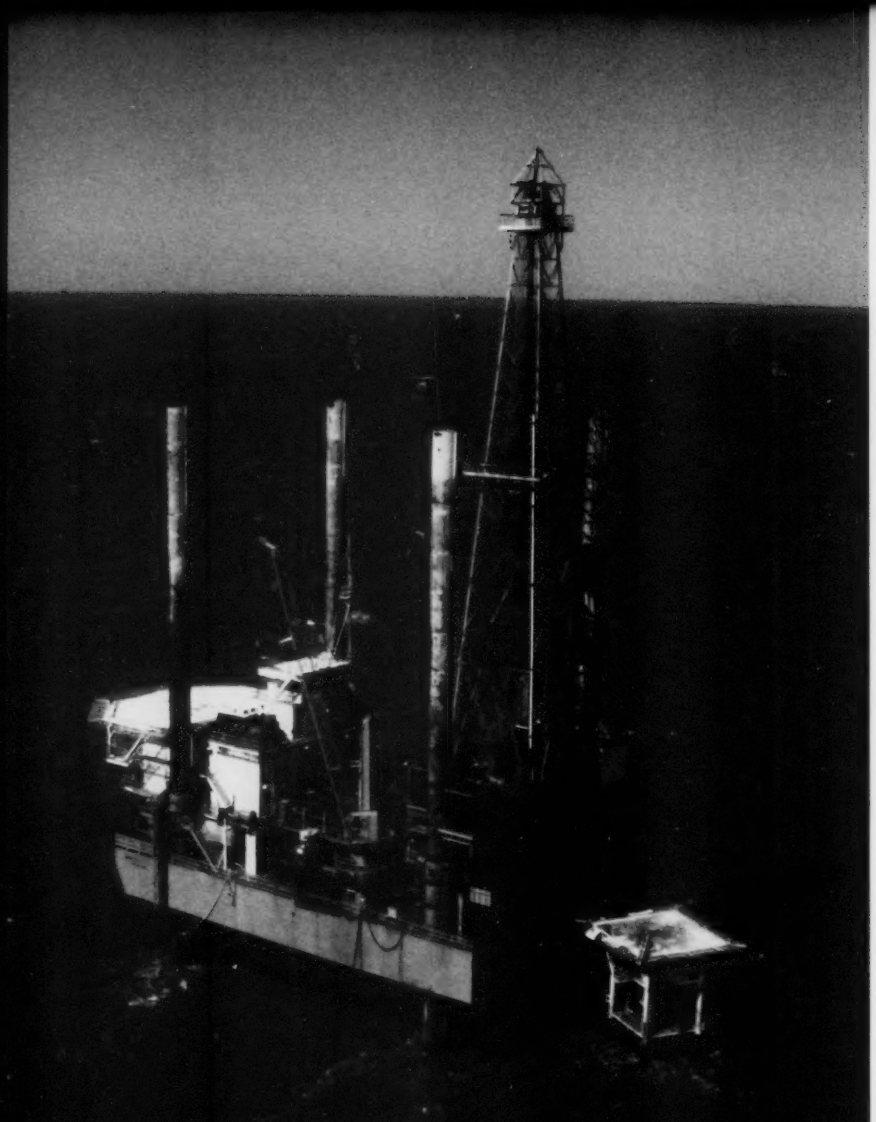
The humidity correction should have the following design elements:

1. When humidity is present, the correction raises density altitude
2. As humidity lowers to zero, the correction also lowers to zero.
3. The corrected performance numbers show a reduction in performance that matches empirical data.
4. No new weather service product is required.
5. The correction is easy to compute.
6. The correction must conform to use in existing performance charts, graphs, and tables.
7. The correction must easily adapt to learnable and easy to remember rules of thumb.

AIRCRAFT PERFORMANCE BASED ON PRESSURE AND TEMPERATURE

In order to begin our investigation of engine and aircraft performance we start at the airport and with the existing atmospheric pressure. Since aircraft performance information is published using the standard atmosphere format, we must find our equivalent altitude in the standard atmosphere. This is accomplished by calculating pressure altitude. The outside atmospheric pressure is equal to a pressure in the standard atmosphere profile. The altitude where this pressure exists is the pressure altitude. By definition "pressure altitude is the altitude in the standard atmosphere where pressure is the same as where you are." Paraphrasing, this correction tells the pilot at what altitude in the standard atmos-





How much humidity do you want? This oilrig off the Louisiana coast on a hot summer day has more humidity than you might like or want when flying into and out of the rig. (H. Dean Chamberlain photo)

phere he/she is equivalently located. Standard procedures exist for calculating pressure altitude.

The second step in estimating aircraft performance is correcting for the difference between our station temperature and the temperature in the standard atmosphere that corresponds to our equivalent altitude. This difference is computed by taking pressure altitude and local temperature and determining density altitude either by flight computer or graph. Standard procedures exist for calculating density altitude. By definition "density altitude is the altitude in the standard atmosphere where air density is the same as where you are."

The definition of density altitude above is misleading. Since air density is a function of pressure, temperature, and humidity, density altitude has been formulated only by using pressure and temperature adjustments. Humidity has not been accounted for or corrected for. In fact, the calculation of density altitude has "assumed that the air was perfectly dry."

[Author's comment: This defect can be a critical safety issue. Now, I know that airplanes have been flying for years without pilots calculating a humidity correction. I am sure that during conditions when humidity effects are high, experienced pilots add mental corrections and safety margins that keep them out of danger. But what about inexperienced pilots, what do they do? When all the little safety margins have been used up, it results in an accident. This leaves a bitter taste in my mouth.

Great pains are taken to calculate corrected course, wind correction factors, courses to intercept, and times of arrival. When there is an ability to accurately calculate a number, pilots are drilled into producing that number. Recall the calculations needed on the navigation log for VFR flight just to get compass course to our destination. That's precise.

It's disconcerting that when it comes to high humidity, no information exists to give us a feel if it is unimportant or critical, and no procedures exist to help us estimate its effects. We are only told "be careful when the temperature and humidity are high."]

NECESSITY TO CORRECT FOR HUMIDITY

"Although the effects of humidity are not shown on performance charts, it does reduce airplane performance. For one thing, it takes up airspace that is normally available for vaporized fuel (and dry air mixture). As humidity increases, less (dry) air enters the engine. The moist air also tends to retard even burning of fuel in the cylinder. When the relative humidity is very high, the engine power loss may be as high as seven percent, and the airplane's total takeoff and climb performance may be reduced by as much as 10 percent."

The above quoted paragraph is also misleading. Sometimes the effects of humidity are negligible. However, during certain conditions, the ef-

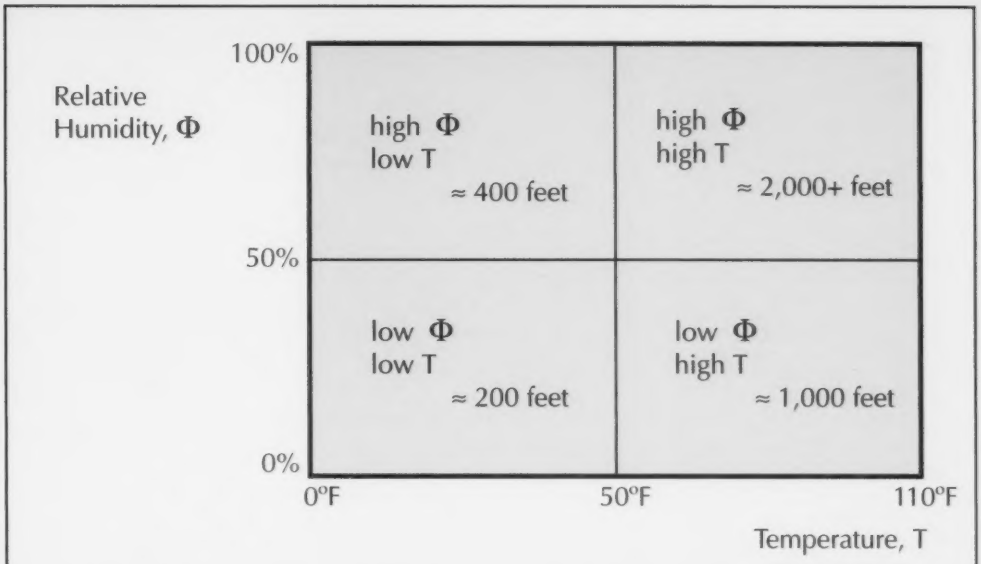


Table I. Table of humidity correction thumb rules. This table shows the four ranges of humidity corrections and can be used to estimate the order of correction in a particular band of temperature and humidity. Example, if the relative humidity is high, i.e. greater than 50%, and the temperature is low, i.e. less than 50°F, the humidity correction is on the order of 400 feet.

fects are very significant. The need for a humidity correction is also implied in the following statement. "The rated horsepower of an engine is determined in dry air and standard atmospheric conditions." For this reason, as water vapor increases, air density decreases, and the engine's power output decreases. This power loss can be as high as seven percent when the relative humidity is 100%. However, no method is given to correct for humidity nor is any guidance given when humidity estimates become important. No standardized tools are provided that quantitatively estimate the effects and when they are important and when they can be ignored. Pilots are left to devise their own estimates of the effects.

Yet knowing that density is a function of pressure, temperature and humidity, the effect of humidity compounds the problem. "The further effects of high temperature and humidity are cumulative, resulting in an increasing high density altitude condition. High-density altitude reduces all aircraft performance parameters. To the pilot, this means that the normal horsepower output is reduced, propeller efficiency is reduced, and higher true airspeed is required to sustain the aircraft's operating parameters." Coupled with the fact that engine testing is performed in dry air and standard atmospheric conditions, an analysis of humidity as it affects density is necessary.

The effect of humidity is a function of the amount of moisture available, measured in relative humidity, and the temperature. So the effects are nonlinear. In fact, the effects are exponential.

"THEORY"

Properties Of Moist Air

The key to unlocking the humidity problem lies in the field of thermodynamics. Moist air is a binary mixture of water vapor and dry air.

Dalton's law of partial pressures is implied in *Aviation Weather* where it states that, "Air is a mixture of several gases. When completely dry, it is about 78% nitrogen and 21% oxygen. The remaining 1% is other gases such as argon, carbon dioxide, neon, helium, and other... However, in nature, air is never completely dry. It always contains some water vapor in amounts varying from almost zero to about 5% by volume. As water vapor content increases, the other gases decrease proportionately. "

As water vapor pressure rises, a corresponding lowering of dry air pressure results. This is the dry air that is the working fluid for our combustion engine or turbine. As dry air pressure lowers, we have less fluid to drive the power plant. A lower dry air pressure implies flying at a higher altitude. An altitude correction is equivalent to a change in pressure. For example, a change of pressure of 1" Hg is equal to a change in altitude of 1,000 feet.

Development Of Water Vapor Using Relative Humidity And Temperature

Relative humidity is defined as actual water vapor present to that which could be present. Relative humidity is measured and reported by weather services. The pressure of saturated water vapor is a function of temperature only. Given the temperature, only one water vapor value exists.

By using the relative humidity, and the pressure of saturated water vapor, we are on our way to calculating a performance altitude correction for humidity.

Table II lists the humidity altitude correction values and figures 1 and 2 graph the altitude correction in feet for 100% humidity as a function of temperature in degrees F. (Remember to

Temperature, °F	H_c feet
32	180.4
40	247.5
50	362.1
60	521.2
70	738.5
80	1,031.4
90	1,420.7
100	1,931.7
110	2,594.6
120	3,444.6
130	4,523.8
140	5,879.5
150	7,566.9

Table II. Values of the humidity performance correction as a function of temperature

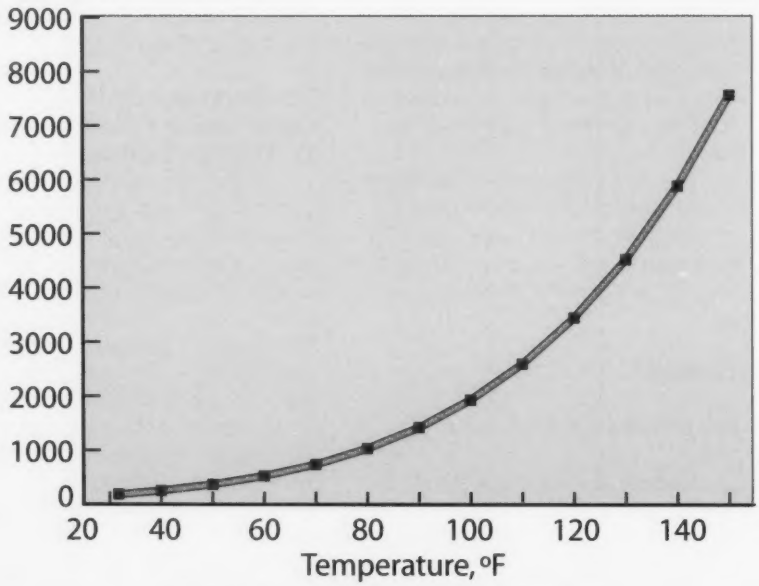


Figure 1. Humidity correction versus temperature plotted from Table II.

multiply this correction obtained from the graph by the measured relative humidity to obtain the actual correction.)

Application Of The Humidity Correction

Recall that a change in altitude corresponds to a change in pressure. Since we know, "water vapor is lighter than (dry) air; consequently moist air is lighter than dry air.

[Author's comment: This is a statement that is sometimes confusing. We know that liquid water is heavier than air, so it would seem that the more moisture is available, the more dense or heavier the air would become. The mistake lies in that moisture in the atmosphere as water vapor is still in the gaseous state rather than a liquid. As the amount of "water vapor" increases in the atmosphere, the more heat it contains. As temperature increases, the air becomes less dense and more unstable.]

Our humidity correction will correspond to an increase in altitude.

We can apply this humidity correction in one of two ways. The first approach will add the altitude correction to density altitude. The second approach will add it to pressure altitude. Then we can compare the results and select the best approach.

Approach 1:

Pressure Altitude + Temperature = Density Altitude

Density Altitude + Humidity Correction = Corrected Density Altitude

Approach 2

Pressure Altitude + Humidity Correction = Corrected Pressure Altitude

Corrected Pressure Altitude + Temperature = Corrected

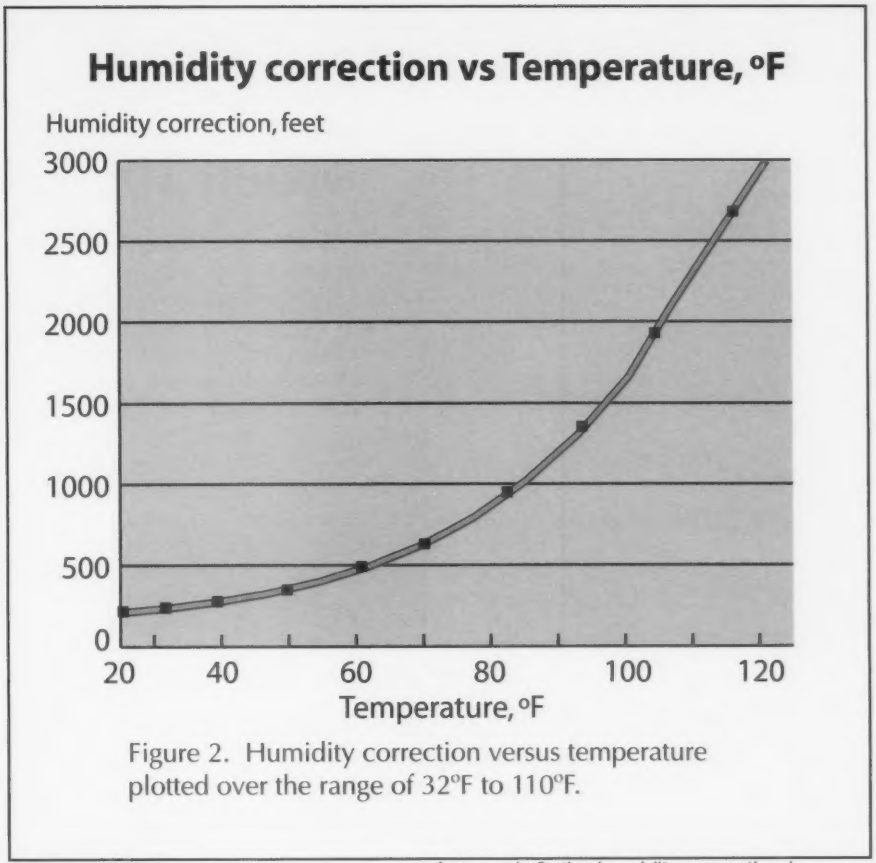


Figure 2. Humidity correction versus temperature plotted over the range of 32°F to 110°F.

Density Altitude

SAMPLE PROBLEM

Calculating Corrected Density Altitude:

Given: Temperature, 92 degrees F
Relative humidity, 92%
Pressure altitude, 2,000 feet

Find: The corrected density altitude using approaches 1 and 2 and compare the results.

Solution:

Density altitude by flight computer = 4,500 feet
Substituting values (using figure 2) = (.92)(1,520) feet (rounded)1,400 feet

Approach 1, the humidity correction is applied to density altitude directly. The corrected density altitude is
(4,500 + 1,400) feet = 5,900 feet

Approach 2, the humidity correction is applied to pressure altitude and then the corrected pressure altitude is used to calculate density altitude. Corrected pressure altitude is

(2,000 + 1,400) feet =3,400 feet

Using this corrected pressure altitude to formulate the corrected density altitude yields,

Corrected density altitude = 6,220 feet

In this sample problem, we can see that the humidity correction is significant. In fact, it is equal to 56% of the temperature correction. Tabulating the results from the above sample problem will allow an in depth analysis.

Traditional density altitude = 4,500 feet
Density altitude + humidity correction = 5,900 feet (up 31%)

Density altitude (using the pressure altitude and then calculating DA) = 6,220 feet (up 38%)

Note, in this sample problem there is a 31% to 38% increase in density altitude because of humidity.

Selection Of Approach

Approach 2, adding the humidity correction to pressure altitude and then correcting for temperature, yields a more conservative and safe result. From the above example a +320 foot difference resulted by varying when the correction was applied. Also approach 2 yields a number that conforms to the format of the newer performance charts that use pressure altitude as an entering argument. For this reason, approach 2 will be selected and used by the author in further computations and analysis.

CONCLUSIONS AND OBSERVATIONS

This article has shown that an easy to determine and easy to use humidity correction now exists. It can be expressed as a pseudo-altitude change and may be determined under all conditions. When incorporated into the other performance altitudes, i.e. pressure altitude and density altitude, it yields a "truer" performance prediction. Under conditions of low humidity and/or low temperature, the humidity correction is small. However, when temperature and relative humidity are high the compound exponential effects of the humidity can adversely affect take off. Significant performance reductions take place. Marginal situations will require the calculation of all performance estimates with precision. Strong emphasis will be needed on checking that all margins of safety are not eliminated by the intangibles. If pilots are in marginal situations, this will give them another tool for the "go/no go" evaluation.

By this article and the develop-

ment of figures 1 and 2, the following conclusions are made:

1. The humidity correction function is easily graphed.

2. As humidity rises, the correction gets larger.

3. As humidity lowers to zero, the correction also lowers to zero.

4. Corrected performance numbers show a reduction in performance (rise in corrected density altitude) that matches empirical data.

5. No new weather service product is required.

6. The correction is easy to compute and conforms to use in existing performance charts, graphs, and tables.

7. The correction easily adapts to learnable and easy to remember thumb rules. See Table I.

8. Below 40 degrees F the correction is small. Even at 100% relative humidity, the correction is on the order of 250 feet.

9. Above 50 degrees F the exponential correction takes off and may become very significant. The term is not as dominant as temperature but, with high humidity, the cumulative effects produce a correction in the 3,000+ foot range.

Applying this correction to pressure altitude yields a more conservative (safer) value of air density for entering existing performance charts and this method conforms to the newer performance chart format which uses pressure altitude as an entering argument.

If the relative humidity is unknown or unavailable, be conservative, assume it to be 100% and add the full correction. The derivation of the humidity correction is then reduced to a temperature function look-up.

Table I provides four easy to remember correction terms, as thumb rules, for the four different temperature and humidity fields. This table should not be used, in place of figure 2, when precision is required.

(Note: There are numerous formulas and sample problems in Mr. Rolfe's article that have been omitted, that are used to verify all his statements and conclusions. The reason for omission was for brevity in the article.)

Roger "N" Clark is the Safety Program Manager at the Des Moines (Iowa) FSDO

When There Are

By Steve Carpenter, M.D.

This article is from Medical Facts for Pilots Publication *AM-400-01/2, which was prepared by the FAA Aerospace Medical Institute's Aeromedical Education Division in Oklahoma City, OK. Check its web site at <www.cami.jccbi.gov/aam-400A/400brochure.html> for a list of other pilot safety brochures.*

Most (more than 90%) of medical certification applicants pass their physical examinations and the Aviation Medical Examiner (AME) is able to issue a medical certificate at the time of the exam. Occasionally, however, a condition is found that requires a process of further review and, possibly, additional testing. The purpose of this article is to help answer some of the questions that you might have about this process.

What are my chances of ultimately being certified?

While it is impossible to predict your individual likelihood of certification, our current process allows us ultimately to certify 96% of individuals whose medical qualifications are initially questioned. Sometimes this process requires a period of recovery from an illness, surgery, or other condition.

Why does it take so long to process my application and other reports?

We receive an average of 1,800 applications for medical certification each day. We are required to review each one to assure that medical standards are met. When an application is found that may not meet the requirements, a letter is written to the applicant, identifying the problem, and outlining the further potential courses of action. We must then wait for a response from the applicant before we can proceed further. Each time new

Questions About Your Medical Qualifications

information is received; the application package must again be reviewed. Given the large number of applications being processed and the amount of time required to evaluate the information, it sometimes takes longer than we all would like.

What can I do to speed the process along?

There are several steps you can take to assure that your application package is processed in the shortest time possible:

Don't hesitate to ask your AME for advice and assistance in gathering the requested information.

When we ask for additional information, we ask for the least amount possible in order to make our decision. This means that we really do need everything that we request, so the first thing that you can do is to make sure that all the information that we have requested is being provided. Also, please understand, if we ask that a certain test be performed in a certain way, that is what we need. Be sure that you take all of our letters with you to your physician, and try to emphasize the importance of exactly fulfilling our requests.

Have all of the requested information forwarded to us in one package.

Do not hide important medical facts from us. This just delays things further. If you send us information about one medical problem and the hospital records indicate a second serious medical problem, which we did not previously know about, we will have to start a new investigation of the second problem.

Give us an adequate amount of time to process your application. If you call or write to find out the status of your application, your file will have to be located and taken out of line to answer the inquiry. This will further delay its processing. On the other hand, if you haven't heard from us in within 60 days, you may call us at the number listed below for an update.

Use this list of items like a checklist to speed the processing of your application.

If my own physician thinks I'm OK to fly, why do you have a problem with me?

Most physicians see their role as one of helping their patients by preventing medical problems when possible and treating medical problems if they do occur. This treatment may actually be a cure or it may be something that diminishes the impact of the medical condition on the person's daily life. There are many conditions that can be cured, such as appendicitis, gall bladder disease, and pneumonia. There are other conditions that can be treated, but are not cured, such as high blood pressure, heart disease, and diabetes. In the case of this latter group, when a physician has done all that is possible to control the disease, the patient may be told that participation in any activity, including flying, is OK. To the treating physician, this means that there is nothing more to be done for the disease and that activity will not make the disease worse. Unfortunately, the treating physician does not always realize that the medical condition could make the activity worse (by making it less safe due to the medical condition). In addition, many physicians only fly as passengers on commercial aircraft. They do not realize the potential problems inherent in piloting aircraft, which may require more from the pilot than his or her medical condition will allow.

Suppose you find me disqualified. What are my options then?

If you are found not medically qualified, you have several options. First, you need to understand why we found you disqualified. If you don't understand why, take our letter to your AME or treating physician and ask for an explanation. Next, write us a letter requesting reconsideration, and explain why you believe that your medical condition should not prevent you from flying. We may then either agree with you and issue a certificate, ask you for further information, or sustain our previous action.

If you still end up being not certified, you have the option of appealing our decision to the National Transportation Safety Board. The Board will hear your arguments in a hearing before an administrative law judge, who will then make an independent decision regarding your eligibility under the medical standards. If the judge's decision is not favorable, you may appeal for further review by the full Board. If that Board's decision is not favorable, you may then pursue the matter through the federal court system.

To contact us, write:
FAA Civil Aerospace Medical Institute
Aeromedical Certification Division,
AAM-300
P.O. Box 26080
Oklahoma City, OK 73126

Or call our customer service telephone number: (405) 954-4821

Our job is to ensure that all pilots are medically qualified to fly. We take this responsibility very seriously. On the other hand, many of us are pilots, and we all work for the FAA because of our interest in aviation. We like to see as many airmen safely certified as possible, and we hope you will be among them.

Tales of an ASI

by Al Peyus

Why does it always happen to me?

Maybe I am a "lightening rod" and attract the nearly average pilots around me. For some reason, I keep finding myself in a location that has more than its normal share of nearly intelligent pilots. I know there are going to be those of you out there who are not going to believe this is factual. But, heaven help us all, it is! This pilot did do and say everything as described. I even have a witness. The local Safety Counsellor was with me while I was talking to the pilot!

I was getting an introductory flight in a new airplane production model. The manufacturer's instructor pilot was sitting next to me as we were turning from crosswind to downwind at a non-towered airport in VFR conditions. As we were almost on downwind, a pilot reported that he was crossing over the airport, midfield, at 1,000 feet over the runway. This was the first call we heard from this pilot. He asked if anyone was in pattern. Both of the airplanes in the pattern told him where each was. One was ahead of us on downwind ready to turn base. We were turning onto the downwind. He acknowledged our calls then proceeded to fly over the midfield location and turn directly into the right downwind forcing our airplane to make a hard left to avoid being hit.

One of the advantages I have as an FAA Aviation Safety Inspector is that I "get" to speak to other pilots officially. After we landed, the other pilot was already on the ground and chocked. He was standing in the terminal waiting for me.

What happened in the next 45 minutes was a perfect example of the proverbial snowball rolling down the hill. As the questions and answers came and went, things just got worse and worse. After asking the first question, I knew I had opened a large can of worms.

I asked the pilot if he knew the recommended way to enter the traffic pattern at an uncontrolled airport. He said yes, and that he had. He was taught, according to him, that the pilot must cross over the center of the airport at traffic pattern altitude, identify the other traffic, then turn immediately into the downwind from the center fly over.

Before I started to correct him, I first asked if he heard the two airplanes in the pattern respond to his question of, "Who is in the pattern?" He told me that he had heard both of us but only saw the one in front of us. Then he did it to me again! He said that because he only saw the one airplane, he felt the first airplane was the only one in the pattern. Not seeing the second airplane, he guessed that it must have been one of those airplanes that like to call downwind when it was still outside the pattern. He felt fully satisfied to make the downwind turn and felt he had violated no one's air space.

I was informed that his CFI had taught him to enter all traffic patterns that way to avoid conflict with other airplanes. Yes, he did have a copy of the current *Aeronautical Information Manual* (AIM), and, yes, he has read the recommended non-towered traffic pattern entry. And best of all, yes, he had entered in the manner depicted in the AIM.

Next, I asked him to show his pilot certificate and medical. He opened his pilot logbook. In a pouch attached to the back of his logbook was his paperwork. There was nothing wrong with that at all. As he got out the four medical forms he had in his possession, I asked him for the current one.

Again, the snowball continues to roll!

I am sorry to say he could not tell me, or show me which of the four medicals was the current one. Now, I know we all do this to some degree. We all save our last medical just in case there is a problem with the new medical such as the doctor failed to send it in on time; there was something wrong with the EKG machine; or an office assistant sent it to the wrong address, etc. So, we save our old medical until it is out of date. But, we do not keep the past eight years of medicals with us at all times.

Would you believe this pilot called his office and asked his secretary which one was the current medical! It was obvious that she was used to dealing with Mr. Businessman-who-does-not-know-aviation. She told him which one was the current medical! He was then informed, as I would like to remind every one out there, to get rid of the old medicals! They cause too much confusion.

Next, I asked to see his airplane.

Continued on Page 33

IN MEMORIAM

H. Dean Chamberlain photo

Final Flights

by Paul Turk

Since the first of the year, the aviation world lost three of its most senior luminaries. Each was a pioneer and a builder, driven to excel.

Jerome (Jerry) Lederer, the "father of air safety," died in California on February 6. He was 101 years old. We can't recount all the details of his life here, but his work in aviation safety started about the same time as the FAA's predecessor agencies came into being, 1926. That year, he was put in charge of air safety at the Airmail Service. The Service's pilots were dying in flaming crashes at an alarming rate, and his research pinpointed the reason for the fires and changes were made. His work then, and throughout his life, has made flying safer for us all. He inspected "The Spirit of St. Louis" before his friend Charles Lindbergh flew it to Paris and expressed his doubts that "Lindy" would make it then and later. Jerry served as Director of Civil Aeronautics Board (CAB) Safety Bureau from 1940 to 1942. The Bureau was responsible for safety rulemaking and accident investigation and was the predecessor of the U.S. National Transportation Safety Board. Jerry is considered the father of the flight data recorder. He helped bring the Flight Safety Foundation into being, and he even took a turn in the space program, establishing NASA's Office of Manned Space Flight Safety. Jerry received the FAA's Distinguished Service Medal, among a long list of high honors (estimated over 100) in the U.S. and around the world. Even in his late 90's, he was still giving speeches, accepting awards and continuing his crusade for what he came to call "risk management."

Jean Ross Howard Phelan, 87, was one of the first women to be licensed to fly a helicopter and was the founder and executive of the international women's helicopter pilot's group best known by its nickname, the "Whirly Girls." She died in Washington on January 29. Jean Ross Howard Phelan always went by the first three names, and when she married Jim Phelan in the mid-1980s, went by all four. It was "Jean," face-to-face, but it was all three (then four) if you referred to her in the third person. Over time, she was probably the one person at any Washington aviation event known to almost everyone in the room, save for perhaps Chuck Yeager if he was there. She learned to fly in the World War II civilian pilot training program, helped run the Women's Air Force Service Pilots' training operation, and after the war went to work for what became the Aerospace Industries Association. It was a few years later that she badgered her way into helicopter flying lessons as part of her association work and became the 13th woman in the world to earn a helicopter license. She promptly went out and organized the other 12 into the Women's International Helicopter Pilots Association. That group is 100 times larger these days, and growing. Jean was director of AIA's helicopter section at the time of her retirement in 1986. She was a regular contributor to publications, and was president of the American News Women's Club in the mid-1960s.

Duane Cole, 89, pioneering aerobatic pilot, died in Fort Worth on February 3. His fame was as an airshow pilot—he even had his name painted upside down on his Taylorcraft because he spent so much time inverted in low passes before the audience. But he was also an author, a teacher, the patriarch of the family's aerial oper-

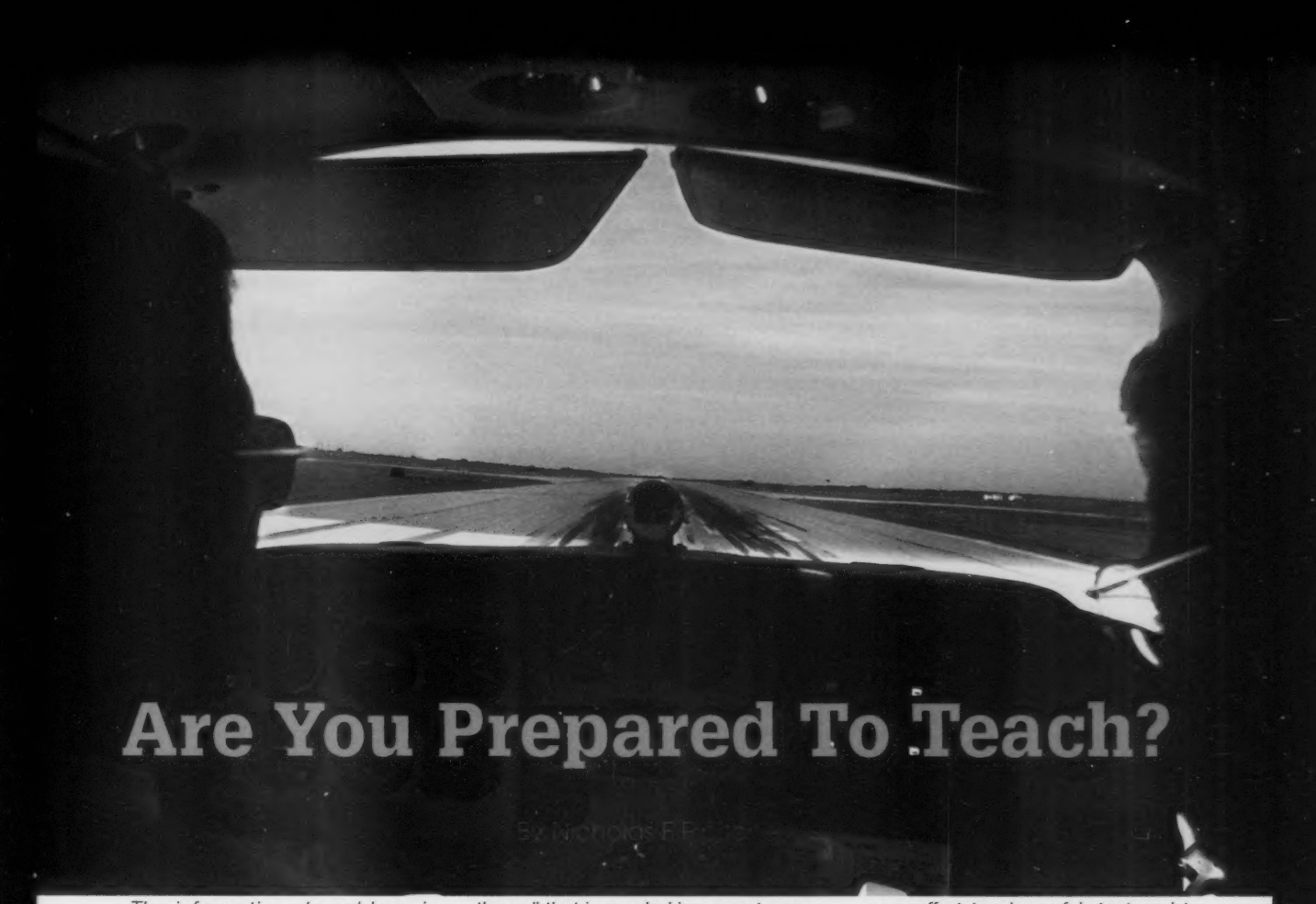
ation, the Cole Brothers Airshow. The show featured all manner of "don't try this at home" exhibitions, including the inverted pickup of flags from close to the ground with a hook at the top of the vertical stabilizer, landing on moving cars and trucks, wing-walking and his signature act, a precision dead-stick landing right in front of the crowd. He was a founding member of the Experimental Aircraft Association, and directed the Reno Air Races in the 1960s. He taught British cadet pilots in the days before the U.S. entered World War II, then would-be U.S. military pilots during the remainder of the war.

Next Journey

by Phyllis Anne Duncan

Galina Gavrilovna Korchuganoba is another pioneer we would like to acknowledge with a tribute written by our former editor.

At the 2002 Women in Aviation International Conference, someone remarked that I might want to interview a couple of Russian pilots, a former World War II bomber navigator and a MiG test pilot—both of whom were women. And so I did, and that is how I met and was touched by the "Two Galinas," whose stories I related in the May/June 2002 issue of FAA Aviation News. Galina Korchuganova was the MiG test pilot who flew just about every make and model that quintessential Cold War bogey manufactured, even those, she bragged, "the men would not fly." She was also a champion aerobatic pilot who competed in worldwide championships and usually beat all she encountered. Yet, her highest accomplishments, she told me, was that she taught a class of women Aeroflot pilots and she founded an aviation club for Russian women pilots called Aviatrissa. At first she could only find 13 women who were active pilots in Russia, but she persisted, bringing in the heroines from the Great Patriotic War (World War II), so that Aviatrissa swelled to some 350 women—truly remarkable in the context of post-Communist Russia. Galina started in aviation at one of the ubiquitous parachute clubs in the then-Soviet Union. She took to jumping out of airplanes so naturally and effortlessly that she earned a scholarship to the prestigious Moscow Aviation Institute, from which she graduated as a design engineer. She flew airplanes for sport—aerobatics—but really wanted to test-fly them, then forbidden to women in the supposedly egalitarian Communist state. It took becoming the World Aerobatic Champion to convince the Ministry of Aviation that a woman could be a test pilot. Galina went on to hold 42 world records in Yaks, MiG's, and AN aircraft. She continued to rack up championships and was rewarded by the USSR with medals but very little official recognition. That was why Galina founded Aviatrissa. After the fall of the Soviet Union, Galina saw that many of her less-awarded women peers, including the Aeroflot pilots she had trained, were being offered jobs as cooks or folk artists. She couldn't abide that shuffling of lives into an obscure corner. The highlight of her tenure at Aviatrissa—she was its first and only president—was the recreation of the Rodina flight. In 1938 three of the USSR's premiere women pilots flew an aircraft named Rodina—homeland—on a record-breaking trip almost the width of Russia. In 1998, two American women recreated that flight to much media attention in Russia (virtually none here), and it wouldn't have happened without Galina's tenacity. In Nashville two years ago she learned to dance the two-step and the souvenir she was most delighted with was her "koiboy shapka"—a cowboy hat. When I interviewed her, she was intent in getting the story across that Russia today may be striving toward democracy but it was leaving behind both the history of women in Russian aviation and the contributions women could make to that new democracy. Galina Korchuganova survived as an individual in a state that forced you to submit to its will, and she even survived the aftermath of the fall of the system that gave her profession, woman pilot, some notice. She could not, however, survive the onslaught of liver cancer, and she is now winning medals and accolades in an aerobatic championship that has no end. Da svedanya, Galya. Vy fmoye serdtse, navsergda. (Goodbye, Galya. You are in my heart forever.)



Are You Prepared To Teach?

By [illegible]

The information shared here is taken from experiences with actual certified flight instructor (CFI) flight tests. I hope these comments will help someone planning on taking a CFI practical test.

The flight instructor certificate (CFI) is more than just a license to teach. It carries with it a responsibility to the general public to produce safe, knowledgeable, and proficient pilots. More often than not, the flight instructor applicant will use this new certification as a means to acquire additional experience and build time and as a steppingstone to the major airlines. There are those on the other hand, who only do it for the love of flying and a desire to teach others.

Often, flight instructor applicants are scheduled for the initial test with only minimal experience in practice instruction. The recommending instructor is often under the mistaken opinion that if the applicant can fly fairly well, then all that is needed is a scant exposure to lesson presentation. This is, of course, very unfortunate and will usually result in disappointment and disapproval of a test. The applicant, of course, suffers the most—feeling the dregs of defeat and a day of embarrassment that should have been one of joy and celebration with the feeling of overwhelming confidence.

Often we hear applicants comment that they've heard that the first attempt often ends in disapproval. Nothing could be farther from the truth. Initial pass rate is approximately 85% nationwide. When this seed is planted in your applicant's mind, the applicant will probably come to the test thinking that this is only a drill in preparation for the next attempt. If my recommending instructor told me this, I would think twice about making a significant expenditure for a test with a Designated Pilot Examiner (DPE). Of course, if an FAA aviation safety inspector (ASI) is available, there is no cost. The DPE's and ASI's make every effort to give a fair test and to send the applicant home with a fresh certificate or rating.

A brief word about the Notice of Disapproval (NOD) or the infamous "Pink Slip." Instructors should be aware that, while the NOD is given to the applicant, it is also a transmittal to the instructor that he or she failed to adequately prepare the student in a given subject area. This information is entered into a national database that identifies the instructor and the areas failed. This information is used to identify instructor shortcomings and may result in reexamination of the instructor's ability to hold his/her instructor certificate. Reexamination will likely not result from a single failure, more likely a history of ill-prepared applicants.

Practical Test Standard

To begin with, instructors should use the Practical Test Standard (PTS) to prepare an applicant for a test re-

Another day on the flight line as aircraft are prepared for the day's flights.

gardless of the certificate level or rating the applicant is applying for. DPE's and inspectors are required to prepare a plan of action in preparation for giving the test. The plan of action is based on the subject areas and tasks outlined in the PTS. For the CFI test, there are areas that are required and other areas that the examiner/inspector may select at random. Failure of any area/task constitutes a failure of the test.

The introduction section of that PTS details what is expected of the applicant. It gives reference to the necessary materials and the required aircraft and equipment to be provided for the test. Showing up for the test without meeting theses requirements means that your applicant goes home with an NOD. This may seem to be cruel and unusual punishment to some, but the instructor and applicant are responsible for meeting the requirements of the PTS.

Stall, Spin Awareness Training

Although your applicant comes to the test with the required endorsements for stall/spin training, it sometimes becomes very obvious after a few basic questions that he/she has not been adequately trained in this very critical area. The vast majority of applicants, who come through the Detroit FSDO, cannot teach/articulate the mechanics of a spin, much less that of a crossed control stall. This leads the examiner to believe that the recommending instructor is deficient in this area as well.

Along this same line and an associated area is the understanding of slips and skids. This area could be an all day discussion of how they relate to crossed control stalls and spins. One last comment on this subject, it is recommended that instructors refresh themselves on the procedures for introducing all of the demonstration stalls. In particular is the crossed control stall which is not to be demonstrated with flaps extended for the reasons explained in the *Airplane Flying Handbook* (FAA-H-8083-3). If you should you enter a spin with the flaps extended, recovery forces may damage the flaps or flap mechanism.

Understanding Slips and Skids

Don't be too surprised when we tell you that this subject is one of the least understood. The majority of flight instructor applicants tested, who came through our FSDO, could not adequately explain slips and skids nor recognize the differences when shown a depiction. Needless to say, this is student pilot stuff.

When questioned about correcting for a skid while maintaining a desired angle of bank, we usually hear, "step on the ball." When you analyze this, the cause for the skid is usually excessive rudder in the direction of the turn or inside rudder. Stepping on the ball may mean meeting an opposing force since the pilot may be applying pressure to the opposite rudder. If excessive rudder is the problem, why not simply say relax the inside rudder to solve the problem? Usually, this will require some readjustment of aileron and angle of bank. This is not rocket science; so let's keep it simple. The instructor is the communicator, so communicate.

The flight instructor is the one person, who influences the law of primacy; recall that early learning principle, what is taught must be taught correctly the first time?

Plan your training sessions to allow for a thorough preflight briefing and post-flight critique. Jumping from one airplane and into the next will only serve to slow and prolong your student's progress. A minimum of 30 minutes on each side of the flight should be planned for each session.

Hopefully, the information shared here will provoke some thought into areas that need consideration when preparing flight instructor applicants for the practical test. Plan to spend a good deal of your applicant's time in developing teaching skills and the thorough understanding of the subject matter to be taught. I usually refer to this as chalk talk or whiteboard talk as the case may be. Ideally, there should be at least two hours of practice chalk talk presentation by the applicant for every hour of practice flight instruction.

Finally, prior to endorsing the applicant for the check ride get an unbiased opinion of your applicant's performance from another instructor or DPE. This should include a lesson presentation and flight evaluation.

Now go and teach!

Nick Pipitone is an Aviation Safety Inspector at the Detroit (MI) Flight Standards District Office.

HELPFUL FAA PUBLICATIONS

Students or instructors will find the following FAA publications helpful. Electronic copies of these publications can be found at <http://afs600.faa.gov>. Under Airman Testing Standards, click on "Training Handbooks." These books are also available from the U.S. Government Printing Office by mail at Superintendent of Documents, P.O. Box 371954, Pittsburg, PA 15250-7954 or phone (866) 512-1800 or FAX(202) 512-2250. For those wanting to order online the web site address is: <http://bookstone.gpo.gov>. Please check with the Government Printing Office for the latest price for each publication.

Aircraft Weight and Balance Handbook, FAA-H-8083-1, dated 1999 (SN 050-007-01258-6) Cost: $14.00 domestic, $19.60 foreign. Provides the aircraft maintenance technician with the method of determining the empty weight and empty-weight center of gravity of an aircraft. Also to furnish flight crew with information on loading and operating the aircraft to ensure its weight is within the allowable limits, and center of gravity is within the allowable range.

Airplane Flying Handbook, FAA-H-8083-3, dated 1999 (SN 050-007-01274-8) Cost: $26.50 domestic, $37.10 foreign. Introduces basic pilot skills and knowledge essential for piloting airplanes. Provides information on airplanes and the operations of airplane systems.

Aviation Instructor's Handbook, FAA-H-8083-9, dated 1999 (SN 050-011- 00079-8) Cost: $20.00 domestic, $28.00 foreign. Intended for flight instructors, ground instructors, and aircraft maintenance instructors. Provides information on learning and teaching and relates this information to the task of conveying aeronautical knowledge and skills to students.

Balloon Flying Handbook, FAA-H-8083-11, dated 2001 (SN 050-007-01313-2) Cost: $17.00 domestic, $23.80 foreign. Introduces the basic pilot knowledge and skills that are essential for piloting balloons.

Glider Flying Handbook, FAA-H-8083-13, dated 2003 (SN 050-007-01350-7) Cost: $34.00 domestic, $47.60 foreign. Designed as a technical manual for applicants who are preparing for glider category rating and for currently certificated pilots who wish to improve their knowledge.

Instrument Flying Handbook, FAA-H-8083-15, dated 2001 (SN 050-007- 01308-6) Cost: $37.00 domestic, $51.80 foreign. Provides the flight student with the basic information needed to acquire an FAA instrument rating. Also serves as a training aid for instructors.

Rotorcraft Flying Handbook, FAA-H-8083-21, dated 2000 (SN 050011-00080-1) Cost: $32.00 domestic, $44.80 foreign. Provides technical assistance to applicants who are preparing for their private, commercial, or flight instructor pilot certificates with a helicopter or gyroplane class rating.

Pilot's Handbook of Aeronautical Knowledge, FAA-H-8083-25, dated 2003. The handbook provides basic knowledge that is essential for pilots. The book is useful to beginning pilots, as well as those pursuing more advanced pilot certificates. Please check with the Government Printing Office's bookstore for ordering details.

Student Pilot Guide, FAA-H-8083-27, dated 1999 (SN 050-007-01265-9) Cost: $3.00 domestic, $4.20 foreign. Provides information on general procedures for obtaining FAA student, recreational, and private pilot certificates.

International Pilot Weather Briefing Services
Honolulu AFSS puts it all together

By Jocelyn Nakashima and George Jackowski

In September 2003, the Honolulu Automated Flight Service Station (AFSS) began a one-year test program offering International Pilot Weather Briefing Service (IPWB) and International Weather Consultation Service (IWCS) to the aviation community.

IPWB INTERNATIONAL SERVICES

IPWB is a complete presentation of all of the elements listed in Annex 3, Chapter 9 of the International Civil Aviation Organization (ICAO) Convention. Honolulu provides the pilot, flight crew, or aircraft operator with an interpreted presentation of all the available weather across a route of flight including adverse conditions, the current and forecast weather for a departure aerodrome, en route, a destination aerodrome, and an alternate aerodrome. The winds, temperatures aloft and known *Notices to Airmen* (NOTAMs) are also provided. Heavy emphasis is placed on adverse conditions, satellite imagery, and the location of the jet stream. Honolulu's specialists are highly trained to interpret the available weather information including satellite imagery, which may be the only source of weather information available for much of the vast Pacific Rim.

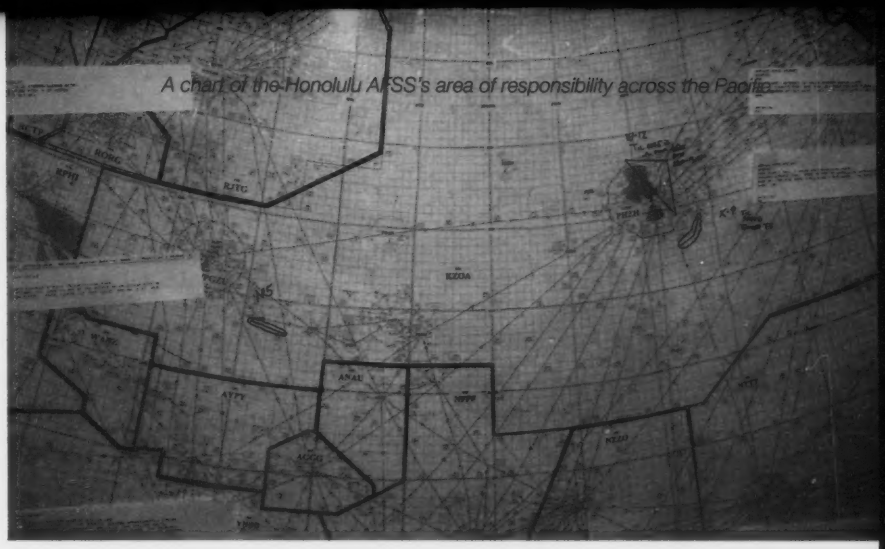
Aviators should note that IPWB service (the complete briefing) is not available for flights below 25,000 feet because significant weather forecasting is not available over most of the Pacific Rim below 25,000 feet. When contemplating flight below 25,000 feet a request for a weather consultation is highly recommended.

HOW A CONSULTATION DIFFERS

The IWCS is a discussion of known and forecasted weather conditions between an FAA specialist and a pilot, flight crewmember, or an aircraft operator. It's not a complete briefing but is intended to supplement or update the information that the pilot, flight crew, or aircraft operator already received. In situations where the specialist does not have access to all the information normally provided in a complete briefing, the specialist will offer a consultation. Planned flights below 25,000 feet are prime examples of when a complete briefing is not available. Another example is when the aviator used the International Flight Folder Documentation program to self-brief or pre-brief and needs to update the information. The aviator may have questions about a worrisome weather system and needs to discuss the system with a professional aviation weather specialist. The International Weather Consultation Service provides an opportunity to ask specific questions about weather issues related to a planned international flight without the complete briefing, it's the pilot's choice.

FLIGHT DOCUMENTATION FOLDERS

It's a printed copy of all the weather data covering a proposed flight and is provided by the NWS for self-briefing purposes, either over the Internet or by FAX back. The pilot must be proficient at self-briefing and interpreting large amounts of very complex weather information. The FAA's ATC specialists are always available to help the aviator interpret the



A chart of the Honolulu AFSS's area of responsibility across the Pacific.

weather information when they feel a need for professional assistance.

Remember, if the aviator wants a complete weather presentation they should ask for an international pilot weather briefing. However, if they just want to discuss specific weather items, then they can ask for an international consultation.

At Honolulu AFSS, international services are provided for flights between the following aerodromes: French Frigate Shoals, Johnston Island, Midway Island, Wake Island, Christmas Island, Palmyra, Kosrae, Pohnpei, Chuuk, Yap, Guam, Kwajalein, Majuro, Rota, Saipan, West Tinian, Babelthuap/Koror, and airports in the Hawaiian Islands.

International services are also available for aircraft departing from the aerodromes mentioned above that are going to the following locations: Tahiti, Tarawa, Rarotonga, Fua' Amotu, Vavau, Nadi, Nauru, La Tontouta, Honiara, Brisbane Australia, Port Moresby New Guinea, Narita Japan, Manila, Taipei, Hong Kong, Alaska, and the Continental United States (CONUS). However, international services are not available when departing from the second group of aerodromes because they are either in a Foreign Flight Information Region or another AFSS's service area. Pilots departing from Alaska or the CONUS are strongly advised to contact their local AFSS for local departure information.

HOW TO GET SERVICES

To obtain IPWB/IWCS services or check the service hours, call the Honolulu AFSS at 1-800-WX-BRIEF or 1-866-766-0820. Let the specialist know that you want International Weather Services. Once connected to the international weather service position, the controller will ask for all the background information needed to provide the requested service. Due to the complexity and amount of information that must be reviewed, the specialist may ask the pilot to call back when the information is ready to be presented. Depending on the service requested and the length of a flight, the request to callback could be up to an hour. When the pilot callsback, he/she will receive the service requested in accordance with the ICAO standards. If the caller requests a consultation, the callback time will normally be less depending on the complexity of the information requested.

Honolulu AFSS developed these services in response to a reassignment of responsibilities within the federal government. FAA has assumed the responsibility to provide all aviation weather briefings, including international briefings. While the Flight Service Stations have many years of experience providing domestic weather briefing services, it has not provided briefing services to such international destinations as Hong Kong, China or Brisbane, Australia. Using ICAO Annex 9 as the basic guideline, Honolulu AFSS developed a training program to allow its employees to gain the skills needed for international briefing.

The preparation to develop classes for the IPWB project began with an intense data-gathering mission. Using the Internet and applicable FAA and DOD publications they conducted topical research to find aeronautical and weather reference materials. International procedures training modules were then developed. The lesson plans and self-study materials included: Oceanic procedures, use of international charts and the *International Flight Information Manual*, and the ICAO Annex 9 rules. Specialists studied geography and the aerodrome folders for 33 new aerodromes along with other important aviation topics. In conjunction with the locally developed training, the National Weather Service (NWS) training unit located at the Mike Monroney Aeronautical Center developed and delivered comprehensive training on global weather systems, satellite imagery, international weather charts, international aviation weather messages, and the international service formats. Upon completion of the training, operational personnel were certified to provide international services.

Pilots are encouraged to use these services when flying in the Pacific Basin area. Given the dynamic nature of the weather systems, it is reassuring to have professional assistance to help interpret and understand the weather dynamics when planning a flight across thousands of miles of liquid real estate called the Pacific Rim.

Pilots are also encouraged to provide feedback and comments about the service by contacting the facility management staff at 808-839-1239.

With the successful completion of the one-year test program, this service will continue to provide valuable support for all aviators planning international flights across the Pacific basin.

+

Air Traffic Manager Jocelyn Nakashima and Operations Manager George Jackowski are with the Honolulu AFSS.

RUNWAY SAFETY CORNER

See and Be Seen

The following information comes from Advisory Circular 91-73, Part 91 Pilot and Flight Crew Procedures during Taxi Operations and Part 135 Single-pilot Operations. *This advisory circular provides guidelines for the development and implementation of standard pilot procedures for conducting safe aircraft operations on the airport surface. It focuses on the activities occurring on the flight deck/cockpit (e.g., planning, communicating, coordinating), as opposed to the actual control of the aircraft (e.g., climbing, descending, maneuvering). Although there are many similarities, taxi operations for single piloted aircraft, as opposed to taxi operations for aircraft that require more than one pilot, present distinct challenges and requirements.*

Over the next several issues, we will be presenting portions of this advisory circular. This section is devoted to the use of exterior aircraft lights in making an aircraft more conspicuous to all other persons directly involved in airport flight and ground operations.

Exterior aircraft lights may be used to make an aircraft operating on the airport surface more conspicuous. Pilots may use various combinations of exterior lights to convey their location and intent to other pilots. Certain exterior lights may also be used in various combinations to signal whether the aircraft is on a taxiway or on a runway, in position on the runway but holding for takeoff clearance, crossing an active runway, or moving down the runway for takeoff.

Because adherence to the guidelines in this advisory circular is voluntary and aircraft equipment varies, flightcrews are cautioned not to rely solely on the status of an aircraft's lights to determine the intentions of the flightcrew of the other aircraft. Additionally, flightcrews must remember to comply with operating limitations on the aircraft's lighting systems.

To the extent possible and consistent with aircraft equipage, operating limitations, and flightcrew procedures, illuminate exterior lights as follows:

(1) Engines running. Turn on the rotating beacon whenever an engine is running.

(2) Taxiing. Prior to commencing taxi, turn on navigation, position, anti-collision, and logo lights. Strobe lights should not be illuminated during taxi if they will adversely affect the vision of other pilots or ground personnel.

(3) Crossing a runway. All exterior lights should be illuminated when crossing a runway.

(4) Entering the departure runway for takeoff. When entering a runway to takeoff, or when taxiing into position and holding for takeoff, illuminate one or more landing lights and all other exterior lights. Strobe lights should not be illuminated if they will adversely affect the vision of other pilots.

(5) Takeoff. Turn on all remaining landing lights when takeoff clearance is received or when commencing takeoff roll at an airport without an operating control tower.

Taxi operations require constant vigilance by the entire flightcrew, not just the pilot taxiing the aircraft. The flightcrew needs to be continually aware of the movement and location of other aircraft and ground vehicles on the airport movement area. Taxi operations require the same planning, coordination, and proper execution, as do the other phases of flight operations. Safe aircraft operations can be accomplished and incidents eliminated if the flightcrew is properly trained and correctly accomplishes standard taxi operating procedures and practices.

To obtain the advisory circular in its entirety, it and other advisory circulars can be found at <http://www.faarsp.org/cockpit.html>.

Aviation Maintenance Alerts

The Airframe and Propulsion and Services Wichita Aircraft Certification Office, ACE-118W, located in Wichita, Kansas, submitted the following articles. (*These articles are published as they were received*.

Defective Fuel Hoses
CESSNA Series 100 and 200 (P/N S1495-6); ATA 2820

Recently the FAA was advised that a current production Cessna single engine airplane experienced a fuel leak at the flexible fuel line connection between the wing fuel tank and the fuselage fuel line connection. The suspect hose is identified in the applicable airplane parts manual as S1495-6, which Cessna has used for many years on all single engine airplane products. Cessna has confirmed that two of their fuel hose suppliers provided hose material to the Cessna Aircraft Co. on 5/13/99 and 12/2/99 that may not meet their specification S1495. Therefore, the FAA recommends that owners, operators, and inspection personnel of Cessna single engine airplanes that may have had a new Cessna Specification S1495-6 fuel hose installed that was obtained/shipped from Cessna Parts Distribution between May 1999 and November 2000 inspect the hoses for rapid age wear. This inspection is recommended to apply to new airplanes with Airworthiness Certificates dated from May 1999 through June 2000 as well as those that have field-installed hoses that may have been shipped from Cessna Parts Distribution between May 1999 and November 2000.

If any of the S1495-6 hose connections have identification markings that indicate Dayco series 7095, any Boston identification, or any identification other than Dayco L3 or B7, remove all S1495-6 hose connections in the LH and RH wing root and replace with new S1495-6 hose having Dayco B706 identification markings. Dayco 6L3 was an approved hose as well, but is no longer utilized under the S1495 specification.

If identification markings are unreadable or not present, inspect all S1495-6 hose connections in the LH and RH wing root areas for evidence of hardening, as described below. If any S1495-6 hose connections exhibit evidence of hardening, remove all of the hose connections in the LH and RH wing root areas and replace with new S1495-6 hose having Dayco B706 identification markings.

Hardening can be determined by pinching the hose between one's thumb and forefinger. Hoses that do not compress or are not resilient can be considered hardened and should be replaced.

The FAA may publish additional advisory and possibly regulatory information applicable to the Cessna S1495 hose installation depending on the results of a current field survey. However, it has been determined that enough time has elapsed since the suspect hoses were shipped from Cessna that routine maintenance might have already encouraged the replacement of some suspect hoses either in the fleet or available from spares support facilities in the field. Therefore, the FAA is publishing this Alerts Article to advise owners, operators, and repair facilities that any remaining S1495 hose shipped from Cessna between May 1999 and November 2000 and possibly installed should be removed from service and any remaining inventory not identified as Dayco B706 should be removed from spares inventory.

CHAFED HYDRAULIC LINES
ALL AIRCRAFT MODELS WITH HYDRAULIC SYSTEMS

Service Difficulty Reports are being received of leaking hydraulic tubing caused by chafing from wiring, and nearby

unprotected equipment and structure on aircraft. In one case, a hydraulic tube located in the aft equipment bay of a Learjet Model 35 was chafed through by an electrical power wire. The chafing had opened a pinhole in the hydraulic line and also removed the insulation from the wiring. This allowed a fine mist of fluid and a small arc to occur at the same time and place, resulting in a localized fire. In another case involving a Cessna Model 550, a hydraulic tube was chafed by a supply duct to the cabin air conditioning system. This resulted in failures of both the hydraulic line and the cabin air supply duct. The failed hydraulic line released fluid into the aircraft air conditioning system exposing the crew and passengers to misting hydraulic fluid.

It is recommended that, when performing maintenance in areas where hydraulic tubes are installed, all aircraft owners, operators, and maintenance personnel should inspect for adequate clearance between the hydraulic tubes and surrounding wiring, equipment, and structure. Particular attention should be applied to the inspection of aircraft with aftermarket modifications or major repairs. Any noted occurrence of hydraulic tubing with inadequate clearance or with evidence of wear from wiring, equipment, or surrounding structure should be repaired, and adequate clearance provided.

FUEL CAPS FOR GENERAL AVIATION AIRPLANES

The FAA recently published an Alerts article (December 2003) applicable to the correct positioning of fuel caps, due to an accident on an Ercoupe Model 415. The FAA has since received a Safety Recommendation concerning a Cessna 182 accident, possibly related to the incorrect placement and closure of an aftermarket fuel cap, which resulted in fuel being siphoned from the wing fuel tank. It appears that some pilots may not be giving sufficient attention to proper installation of fuel caps prior to flight.

The Safety Recommendation requested reference marking on the fuel cap be added to allow a person to visually determine if the caps are properly locked in place on all airplanes equipped with this type of aftermarket fuel cap. The fuel cap in question was a screw-type cap, similar to many current automotive fuel tank, oil service and lawnmower applications. The FAA believes that this standard type of fuel cap and the method of installation do not warrant adding reference marking. Standard, typical procedures such as those required for common everyday consumer products should be adequate to preclude improper fuel cap installation.

The FAA encourages aircraft pilots, fuel service personnel and mechanics to maintain vigilance during preflight, servicing, minor and major maintenance and inspection of all aircraft fuel systems and especially the fuel cap installation on all airplanes.

The Aviation Maintenance Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those who operate and maintain civil aeronautical products and can be found on the Web at <http://www.faa.gov/avr/afs>. Click on "Maintenance Alerts" under Regulations and Guidance. The monthly contents include items that have been reported as significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts' readers prompt notice of conditions reported via Malfunction or Defect Reports, Service Difficulty Reports, and Maintenance Difficulty Reports. Your comments and suggestions for improvement are always welcome. Send to: FAA; ATTN: Aviation Data Systems Branch (AFS-620); P.O. Box 25082; Oklahoma City, OK 73125-5029.

Tales of an ASI

Continued From Page 22

My intent was to do a ramp inspection and make sure all was well with his transportation home. The snowball is getting bigger! He excused himself and went into the local FBO. Not even out of earshot of me, he asked the owner if he had a sectional of the local area. Would you believe that he got my attention, again?

After buying the sectional, I asked him if he flew the route to this airport often. He stated that he makes the trip at least twice a month. When asked about the sectional, he told me that he had meant to get a new sectional, but his FBO has been out of them for about four months. Somehow, he just has not been able to get a new one, but he has the old one in his airplane. The sectional he eventually showed me was two years out of date!

He said he flies his friend down to meetings in the area about twice a month and then takes him home. Without prompting, my new friendly pilot told me that his passenger pays for the fuel and buys him lunch for his time. Does this sound a little familiar to a 14 CFR part 135 charter flight to anyone besides me?

As we were walking out to his airplane, I noticed a new exhaust stack sticking out of the bottom of the cowling. When I asked about it, he told me he had this new company put this on his airplane as the first of its kind for his model. He was very proud of the new exhaust. I had to ask if he had the FAA Form 337 for it in the airplane. He was not sure and looked all over the airplane for it. After it became clear he could not find it, he told me that it was the same shop that replaced his engine for a bigger one so they should have all that information at their shop!

In his airplane and engine logbooks were notations that a new engine and exhaust stack had been installed on his airplane. Missing were the 337 forms, or anything that showed these were STC'ed, approved, or authorized in any manner, shape, or form! Can you begin to see the size of the snowball now?

I have to be honest here. After finding out this gentleman, who was 72 years old, had just received his pilot certificate six years before, bought his airplane immediately afterward, and has used it mostly as his "snow bird" escape vehicle between a northern state and a southern one. That, and the occasional unofficial charter for his friend! He honestly did not know he was in the wrong on any of the multiple violations facing him. He felt he was following the instructions given him by his instructor.

Well, I felt the best route for me, the aviation public, and this gentleman in front of me was to counsel him and demand he seek additional instruction from another CFI. There were three problems facing me as I was talking to this friendly, but confused, pilot. How do I keep the skies safe with him flying? How do I get him to change his ways? And, what can I do to assure the changes are accomplished?

The short story is the pilot was counselled. The airport manager was informed of his actions, name, and aircraft tail number. And the Flight Standards District Offices at both his northern and southern homes were notified of his actions and the demands I placed on his instruction. That way, everyone would be able to check and make sure he did get the correct information he needed to fly safely.

The points I would like you to remember out of all this are:

- We must all be alert to activity around us at all times.
- There is always more to the tale then the initial attention getting action.
- A violation may not always be the best way to keep everyone safe in the skies, and,
- There are many more pilots like this gentleman out there.

Situational awareness is something pilots need to have at all times. It can save your life, or at least keep your blood pressure from going bonkers. If you see something going on that does not seem proper, or you know someone is acting in contrary to the regulations, please notify the nearest Safety Counsellor or call your local FAA Flight Standards District Office and let someone know what is going on. We all want to be able to share and enjoy our airspace while having fun safely, or it is not worth doing!

Al Peyus is an Aviation Safety Inspector with the Flight Standards Service's General Aviation and Commercial Division.

Calendar of Events

April 24, 2004. New England Aviation Expo, Nashua, New Hampshire

The daylong program is designed specifically to educate and promote the safety of general aviation throughout New England and will feature workshops, exhibits, seminars, and WINGS credit. For more information call (603) 879-6807 or check the web site at <www.faa.gov/region/ane/expo>.

September 13-16, 2004. Bird Strike Committee USA/Canada, Baltimore, MD

The meeting will be held at the Hyatt Regency. Anyone interested in minimizing conflicts between birds and aviation and reducing wildlife strike hazards will find more information at <www.birdstrike.org> or by calling (419) 625-0242.

• Round Engines And Fuel

I found the *FAA Aviation News* September/October 2003 issue very interesting. Al Peyus' "Tales of an ASI—I Remember When" review of the days of many kinds of aviation gas was very good. However, I was a flight engineer starting at Eastern Air Lines in 1957 and moving through the big round-engine days on Lockheed L-749, L-1049, L-1049C, G, and H models, and DC-7B and DC-7C's, I remember using 115/145 grade of aviation fuel only. Mr. Peyus refers to the purple gas 130/145, which I believe is a very small error in an otherwise well done report.

Mr. Jerry S. Woolf
Lakewood, NJ

The following is an extract from a letter Mr. Peyus sent to Mr. Woolf. "Thank you for your response regarding the 115/145 grade purple fuel for the "round" engines. It is always a delight to find that there are people out there that do read the articles.

You are most correct and I erred badly. The fuel was 115/145 and not 130/145 as you caught. I failed to note the correct language when typing the article.

I am delighted to hear from those of you who had the opportunity to fly the grand old ladies of yesteryear! Those machines produced a sound and feel that today's aircraft fail to replicate. There was a feeling of raw power as the engines came to life and pulled at the bit to prove her worth in the sky.

FAA AVIATION NEWS welcomes comments. We may edit letters for style and/or length. If we have more than one letter on the same topic, we will select one representative letter to publish. Because of our publishing schedules, responses may not appear for several issues. We do not print anonymous letters, but we do withhold names or send personal replies upon request. Readers are reminded that questions dealing with immediate FAA operational issues should be referred to their local Flight Standards District Office or Air Traffic facility. Send letters to H. Dean Chamberlain, FORUM Editor, FAA AVIATION NEWS, AFS-805, 800 Independence Ave., SW, Washington, DC 20591, or FAX them to (202) 267-9463; e-mail address:

Dean.Chamberlain@faa.gov

• New Airmen Certificates

After having just read the article in the January/February 2004 issue of *FAA Aviation News* dealing with the new airman's certificate, I would like to know if I can send in and get the new plastic pilot and mechanic certificates even though I recently had my certificate numbers changed and got new paper ones a couple of months ago?

William G. Cameron
Via the Internet

Yes, you can request the new plastic certificates. You just need to go to the FAA's web page at <www.faa.gov>. Then check the right column under "Fast Answers" for the link to " Replace or change my license." Please scroll down to the bottom of that page to the section titled, "Related Answers." There is a link dealing with the new plastic cards. That link will provide you with the information on replacing your certificates and the cost involved. The following information was copied from that link site.

Follow the same procedure you would use to replace a lost or stolen license. You will have to pay the $2 fee. When you get the new license, it will be the new style.

Submit a signed, written request stating your name, date and place of birth, social security number and/or certificate number, and the reason for replacement to the mailing address below. Go to <http://registry.faa.gov/docs/8060-56.pdf> for a form to request replacement of your lost or destroyed airmen certificate. Mail it to: FAA, Airmen Certification Branch, AFS-760, PO Box 25082, Oklahoma City, OK 73125-0082

Include a check or money order for $2 (U.S. Funds) for each license, made payable to the FAA. If your current address is listed as a Post Office Box (POB), General Delivery, Rural Route, or Star Route, please provide directions or a map for locating your residence. Allow four to six weeks for processing. We can issue only one copy of each license. We can't use the original date of issue on a replacement license. We cannot issue replacements for expired licenses.

Please visit the FAA's Airmen Certification web site at <http://registry.faa.gov/airmen.asp#ReplacementofCertificates>. For further question about this topic please contact the Civil Aviation Registry by e-mail at <airmen@registry.jccbi.gov>.

I hope this answers your questions.

• Kudos from AOPA

You could have knocked me over with a feather as I began to read Susan K. Schmidt's Inspectors Applaud Changes on New Airman Certificate in the January/February edition of *FAA Aviation News*. I had no idea that my column from AOPA Pilot was even slightly responsible for the new certificate. I didn't even think that any one at the FAA even read such material. But I am delighted to have played a role even if it was only to encourage the new certificate.

Nevertheless, please allow me to thank you and those responsible for the new certificate. It is such a wonderful improvement over the old paper style and does appropriately reflect the accomplishments of those who earn them.

Kudos also to Ms. Schmidt for a job well done.

Barry Schiff
Los Angeles, California

GPS INSTALLATION GUIDANCE RELAXED

Global positioning systems (GPS) are no longer labeled new technology according to newly released FAA Advisory Circular 20-138A, *Airworthiness Approval of Global Navigation Satellite System (GNSS) Equipment*. This new advisory circular (AC) replaces AC 20-138, which was issued in 1994. Since that time, the use and installation of GPS technology is a common occurrence and considerable experience has been obtained. In fact, it is one of the most commonly installed navigation systems for light general aviation aircraft, so approved data for every installation is no longer appropriate.

This means that repair stations may now install GPS using standard alteration criteria that would be used for any traditional navigation equipment. In many, but not all, cases, the GPS installation might be considered a minor alteration. The advisory circular should be read before a GPS is installed to make sure that the proper procedures are followed.

A copy of the AC can be found on FAA web site, <www.faa.gov>. Under "Quick Find," click on "advisory circulars" and type in 20-138. Or a hard copy may be obtained by writing to the U.S. Department of Transportation, Subsequent Distribution, Office Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785.

FLIGHT STANDARDS SERVICE DIRECTOR'S AWARD

Flight Standards Service Director James J. Ballough (L) presented George Galo (C), Manager, Washington Flight Standards District Office (FSDO) a "Director's Award" on December 29, 2003, for the outstanding actions of the FSDO in response to the events of September 11, 2001. The Director's Award recognizes the FSDO's support following the events of 9/11 which included providing 24-hour surveillance on its three assigned Part 121 air carriers and providing inspectors to support the around the clock investigation of the attack on the Pentagon. Lawrence Fields (R), Manager, Eastern Region Flight Standards Division, participated in the presentation.

FAA AND AIRLINES TO REDUCE FUEL TANK FLAMMABILITY

In a move that would significantly improve aviation safety, the Federal Aviation Administration (FAA) is considering a proposal that would require airlines to install new systems to further reduce fuel tank flammability on new and existing large-passenger jets.

The FAA is considering a Notice of Proposed Rulemaking for later this year that would help prevent fuel tank explosions by requiring that new systems — those that would reduce the flammability of fuel tank vapors on the ground and in flight — be installed on those Boeing and Airbus models whose air conditioning systems could cause heating of center-wing fuel tanks. These new fuel tank systems work by replacing oxygen in the fuel tank with an inert gas, preventing the potential ignition of flammable vapors. The National Transportation Safety Board has long advocated eliminating ignition sources and reducing fuel tank flammability.

The FAA's approach to both eliminating ignition sources and reducing fuel tank flammability could eliminate up to four accidents over the next 25 years. Center-wing fuel tank explosions, including the 1996 TWA 800 accident, have resulted in 346 fatalities.

In May 2002, the FAA unveiled an innovative prototype inerting system that is lightweight and uses no moving parts. Boeing used the FAA's prototype to develop its own Nitrogen Generating System and plans to install the system on new production airplanes

voluntarily beginning in 2005. The FAA also continues to assist Airbus' flight-testing program of the company's on-board inerting system, which also uses the FAA's prototype.

The FAA is considering requiring flammability reduction systems on new airplane models, such as the Airbus A-380 and Boeing 7E7. The FAA proposal would also prompt a retrofit of 3,800 Airbus and Boeing airplanes over seven years, with Boeing 737, Boeing 747, and Airbus A320 models to be retrofitted first. The preliminary estimate for the total cost for retrofitting the U.S. fleet is approximately $600 to $700 million.

SMALL AIRPLANE NOISE LIMITS NPRM

In the February 11, 2004, *Federal Register*, the FAA published a notice of proposed rulemaking (NPRM) proposing a change to the noise limits for propeller-driven small airplanes. The proposed rule includes a six dBA noise limit reduction for single-engine propeller-driven small airplanes having maximum take-off weight less than 1,257 lb. (570 kg), and a three dBA noise limit reduction for airplanes with weights above 3,307 lb. (1,500 kg). The noise limit would increase at a rate of 10.75 dB per doubling of weight between 1,257 lb and 3,307 lb. The proposed change would ensure that the noise level of single-engine propeller-driven small airplanes is held to that appropriate for current noise abatement technology. The new limits will apply to new type certificate (TC) and supplemental type certificate (STC) for which application is made after November 4, 2004.

This proposal is based on the noise limit change adopted by the International Civil Aviation Organization (ICAO) Annex 16 on February 26, 1999. The FAA, the European Joint Aviation Authorities (JAA), and representatives from the United States and European propeller-driven small airplane industries developed the ICAO Annex 16 noise limit change in a joint effort. The proposed change would provide nearly uniform noise certification standards for airplanes certificated in the United States and in the JAA countries. The harmonization of the noise limits would simplify airworthiness approvals for import and export purposes.

The FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views by June 10, 2004. We also invite comments relating to the economic, environmental, energy, or federalism impacts that might result from adopting the proposals in this document. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. Please send your comments (identified by Docket number FAA-2004-17041) by one of the following methods (please send two copies of written comments):

Go to the DOT Docket web site at <http://dms.dot.gov> and follow the instructions for sending your comments electronically.

Mail or hand carry to Docket Management Facility, U.S. DOT, 400 Seventh Street, SW, Room PL-401, Washington, DC 20590-001

Fax to (202) 493-2251.

COMMENT DATE EXTENDED FOR CESSNA AD

The FAA published in the February 27, 2004, *Federal Register* a Supplemental Notice of Proposed Rulemaking reopening the comment period of Airworthiness Directive (AD) 86-04. This AD concerns a Cessna designed add-on shoulder harness assembly accessory kits for the pilot/co-pilot seats for certain Cessna airplanes. These shoulder harness assemblies incorporate a retainer spring in the adjuster on the upper and lower shoulder harness. The retainer spring may have been inadvertently installed on the belt friction pin. This installation of the spring in the upper shoulder harness adjuster will not allow the belt webbing to lock in place.

The FAA proposes to revise an earlier proposed airworthiness directive (AD) to supersede AD 86-26-04 that applies to certain Cessna Aircraft Company (Cessna) 120, 140, 140A, 150, F150, 170, 172, F172, FR172, P172D, 175, 177, 180, 182, 185, A185E, 190, 195, 205, 205A, 206, P206, P206E, TP206A, TU206, TU206E, U206, U206E, 207, T207, 210, T210, 336, 337, and T337 series airplanes. The earlier NPRM proposed to retain the actions of AD 86-26-04, add additional airplanes to the applicability section, and incorporated revised manufacturer service information. This proposed AD would retain the actions of earlier NPRM and add additional airplanes to the applicability section of this proposed AD.

The FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views by April 9, 2004. Please send your comments (identified by Docket number 2003-CE-40-AD) by one of the following methods (please send two copies of written comments):

1. By e-mail: 9-ACE-7-Docket@faa.gov. Comments must be sent as attached electronic files (at least Microsoft Word 97 for Windows or ASCII). The message also must contain "Docket No. 2003-CE-40-AD" in the subject line.

2. By mail: FAA, Central Region, Office of the Regional Counsel, Attention: Rules Docket No. 2003-CE-40-AD, 901 Locust, Room 506, Kansas City, MO 64106.

3. By Fax: (816) 329-3771.

A Question of Direction

As a self-proclaimed airport person of dubious means, not to be confused with your classical airport bum, I have spent a lot of time over the years trying to find small, out of the way, general aviation (GA) airports. Whether it is a hobby or passion, I am not sure. But having lived in many states over the years and driven through most of the other states, I have one issue that I want to discuss with you. With one notable exception in Florida that comes to mind, I have found it difficult to find most general aviation airports. Frankly, it is much easier to find the local fast food establishment than it is to find the local airport. The reason is most fast food establishments advertise their locations though billboards and other signs along the highways. In fact, many interstate highways now have informational signs showing what food establishments are at the exit including, their direction, and distance from the exit.

The same cannot be said about small airports. In many cases, I could not find any GA airport signs while searching for the airport. In some cases, I found those airports that had put up the typical small airport sign had in fact installed the sign on the airport's perimeter fence or within sight of the airport. If I can see the fence, I can see the airport. I would have liked the sign several miles down the road. I realize that signs are expensive. I also realize that there may be some debate as to who should or is responsible for promoting the airport. But, as a former advertising person, I can say that if you don't help someone find your airport, how can you expect that person to want to learn to fly at your airport, buy some merchandize, or rent an aircraft.

I would like to offer the following suggestion. The next time you drive to your local GA airport, put yourself in the position of someone from out of town who has no idea where your airport is located. Then, ask yourself, "Could I find the airport if I didn't know where it was located?" If not, you might want to think about how you can help someone find the airport. By viewing your drive though the eyes of a stranger, you will get an idea of what kind of help you should provide for others. What type and size of signs would help? In the case of the Florida airport, the first sign was just off the interstate highway. Then every turn was marked. Although the route was several miles long, signs marked every turn until directing you into the airport parking lot.

You should be proud of the fact your community has a GA airport. Help show it off to the world by helping others find it. Work with your local airport manager and community to promote the airport, including showing people how to find the airport. Yes, I realize the current terrorist threat still exists, but I also believe really bad guys know the location of their potential targets. The only ones who don't are your innocent neighbors and those visiting the area. So, whether through signage, locally produced brochures displayed in restaurants or motels, or through large billboards along the highways and byways, think about helping someone find your airport. Who knows, the person who follows your signs to your airport today, may be the person who can help you save the airport tomorrow.

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